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Southbound left turn lane

- Eastbound left turn lane
- Westbound left turn lane
- Los Coyotes Diagonal/Bellflower Boulevard
  - Eastbound left turn lane
  - Westbound left turn lane
- · Willow Street/Los Covotes Diagonal
  - Southbound left turn lane
  - Eastbound left turn lane
  - Westbound left turn lane
- Willow Street/Woodruff Avenue
  - Northbound left turn lane
  - Southbound right turn lane
  - Eastbound left turn lane
  - Westbound left turn lane
- Stearns Street/Palo Verde

  - Northbound left turn lane
  - Eastbound left turn lane
- Westbound left turn lane
- · Atherton Street/Studebaker Road
- Eastbound left turn lane SR-22 WB On/Off-Ramp/Studebaker Road
  - Southbound left turn lane
- SR-22 EB On/Off-Ramp/Studebaker Road
  - Northbound right turn lane
  - Southbound left turn lane
- 7<sup>th</sup> Street/Pacific Coast Highway
  - Southbound left turn lane
- 7<sup>th</sup> Street/Bellflower Boulevard
  - Northbound right turn lane
  - Southbound left turn lane
  - Southbound right turn lane
  - Eastbound left turn lane
- Pacific Coast Highway/Bellflower Boulevard
  - Southbound left turn lane
  - Eastbound left turn lane
- 7<sup>th</sup> Street/W. Campus Drive
  - Southbound left/right turn lane
- 7<sup>th</sup> Street/E. Campus Drive
  - Southbound left turn lane
  - Eastbound left turn lane

The freeway off-ramp vehicle queuing is also shown in Table 4.5-4. During the peak hours, two freeway off-ramp locations are anticipated to exceed the available storage length under year 2040 Alternative 2 conditions:

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- Carson Street/I-605 SB Off-Ramp
  - Southbound left turn lane
- SR-22 EB On/Off-Ramp/Studebaker Road
  - Westbound right turn lane

#### 4.5.4 Alternative 2 (Year 2020) Freeway Traffic Analysis

Findings for the northbound and southbound freeway segments under Alternative 2 conditions for year 2020 are summarized in Table 4.5-5. The peak hour capacity, demand volume, D/C ratio, density and LOS for all the freeway segments are shown.

Under Alternative 2 conditions for year 2020, the I-405 freeway mainline segments are projected to operate at either LOS E or F during the AM and PM peak hours in both directions with few exceptions. The exceptions include the I-405 southbound segments between Studebaker Road to I-605 southbound ramp which is projected to operate at LOS D during the AM peak hour. Majority of the northbound and southbound I-405 HOV lanes are anticipated to operate at overcapacity during the AM or PM peak hours under year 2020 Alternative 2 conditions with D/C ratios ranging from 1.04 to 1.46.

Under Alternative 2 conditions for year 2020, the I-605 freeway mainline segments are projected to operate between LOS B and LOS E during the AM and PM peak hours in both directions except for the segment between Carson Street and Spring Street, which southbound movement is anticipated to operate at LOS E during both the AM and PM peak hour.

Under Alternative 2 conditions for year 2020, the SR-22/7th Street freeway mainline segment between Pepper Tree Lane and Studebaker Road, is anticipated to operate at LOS B or LOS C during the AM and PM peak hours in both directions, while the segment between Studebaker Road and I-605, is anticipated to operate from LOS D to LOS F during the AM and PM peak bours in both directions.

#### Ramps and Ramp-Freeway Junction Analysis and Levels of Service

The density and LOS for each of the ramps along I-405, I-605 and SR-22/7th Street within the study area for Alternative 2 are based on projected Alternative 2 year 2020 traffic volumes. Table 4.5-6 provide a summary of the findings from the analyses for year 2020 Alternative 2 conditions during the AM and PM peak hours. The peak hour capacity, demand volume, D/C ratio, density, and LOS for each of the freeway ramps are presented.

Under Alternative 2 conditions for year 2020, the projected LOS for the I-405 ramp junctions generally ranges from LOS B to LOS F, depending upon time of day and direction of travel. For the I-605 ramp junctions, the peak hour LOS generally ranges from LOS A to LOS E, depending upon time of day and direction of travel. The peak hour LOS expected for the SR-22/7th Street ramp junctions, generally ranges from LOS C to LOS F, depending upon time of day and direction of travel.

The freeway-to-freeway branch connectors are anticipated to operate at under-capacity during both AM and PM peak hours except at two locations. The D/C ratio for the branch connector

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from I-605 southbound to 7th Street/I-405 is anticipated to be 1.42 and 1.17 during the AM and PM peak hours, respectively. The branch connector from I-605 southbound/I-405 southbound to 7th Street is expected to have a D/C ratio of 1.14 during the AM peak hour.

#### Weaving Analysis

Weaving analysis was conducted between on-ramps and off-ramps spaced less than 2,500 feet apart. Separate analyses were conducted, as appropriate, for freeways and C-D roads. Weaving analysis for Alternative 2 are based on projected year 2020 Alternative 2 traffic volumes. Table 4,5-7 summarizes the weaving analysis findings for year 2020 conditions for Alternative 2 for both the freeway segments and the C-D roads. The density and LOS for all the weaving sections are shown.

Under year 2020 Alternative 2 condition, the I-405 freeway weaving segments are anticipated to operate at LOS E or LOS F during the peak hours except at one location during the AM peak hour. The I-405 southbound freeway weaving segment between Palo Verde Avenue/Stearns Street and Studebaker Road is expected to operate at LOS D during the AM peak hour. Weaving analysis was conducted for the C-D roads at the Lakewood Boulevard/Willow Street interchange and the Bellflower Boulevard/Los Coyotes Diagonal interchange. The analysis shows that the weaving segments on the C-D roads are anticipated to operate between LOS A and C during the peak hours.

#### 4.5.5 Alternative 2 (Year 2040) Freeway Traffic Analysis

Findings for the northbound and southbound freeway segments under Alternative 2 conditions for year 2040 are summarized in Table 4.5-8. The peak hour capacity, demand volume, D/C ratio, density and LOS for all the freeway segments are shown.

Under Alternative 2 conditions for year 2040, the I-405 freeway mainline segments are projected to operate at either LOS E or F during the AM and PM peak hours in both directions. The northbound and southbound I-405 HOV lanes within the project limits are anticipated to operate at over-capacity during the AM or PM peak hours under year 2020 No Build Alternative conditions with D/C ratios ranging from 1.06 to 1.58.

Under Alternative 2 conditions for year 2040, the I-605 freeway mainline segments are anticipated to operate between LOS C and LOS D during the AM and PM peak hours in both directions except for the freeway segment between Carson Street and Spring Street. The southbound I-605 freeway segment between Carson Street and Spring Street is anticipated to operate at LOS F and E during the AM and PM peak hours, respectively.

Under Alternative 2 conditions for year 2040, the SR-22/T<sup>th</sup> Street freeway mainline segment between Pepper Tree Lane and Studebaker Road, is anticipated to operate at LOS B or LOS C during the AM and PM peak hours in both directions, while the segment between Studebaker Road and I-605, is anticipated to operate between LOS D to LOS F during the AM and PM peak hours in both directions.

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#### Ramps and Ramp-Freeway Junction Analysis and Levels of Service

The density and LOS for each of the ramps along I-405, I-605 and SR-22/7<sup>th</sup> Street within the study area for Alternative 2 are based on projected year 2040 Alternative 2 traffic volumes. Table 4.5-9 provide a summary of the findings from the analysis for year 2040 Alternative 2 conditions during the AM and PM peak hours. The peak hour capacity, demand volume, D/C ratio, density, and LOS for each of the freeway ramps are presented.

Under Alternative 2 conditions for year 2040, the projected LOS for the I-405 ramp junctions generally ranges from LOS B to 1.OS F, depending upon time of day and direction of travel. For the I-605 ramp junctions, the peak hour LOS generally ranges from LOS A to LOS F, depending upon time of day and direction of travel. The peak hour LOS expected for the SR-2271 Street ramp junctions, generally ranges from LOS C to LOS F, depending upon time of day and direction of travel.

The freeway-to-freeway branch connectors are anticipated to operate at under-capacity during both AM and PM peak hours except at two locations. The D/C ratio for the branch connector from I-605 southbound to 7th Street/I-405 is anticipated to be 1.54 and 1.26 during the AM and PM peak hours, respectively. The branch connector from I-605 southbound/I-405 southbound to 7th Street is expected to have a D/C ratio of 1.14 during the AM peak hour.

#### Weaving Analysis

Weaving analysis was conducted between on-ramps and off-ramps spaced less than 2,500 feet apart. Separate analyses were conducted, as appropriate, for freeways and C-D roads. Weaving analysis for Alternative 2 is based on projected year 2040 Alternative 2 traffic volumes. Table 4.5-10 summarizes the weaving analysis findings for year 2040 conditions for Alternative 2 for both the freeway segments and the C-D roads.

For year 2040 conditions, the mainline freeway weaving segments are projected to operate at LOS E to LOS F during the peak hours. Weaving analysis was conducted for the C-D roads at the Lakewood Boulevard/Willow Street interchange and the Bellflower Boulevard/Los Coyotes Diagonal interchange. The analysis shows that the weaving segments on the C-D roads are anticipated to operate between LOS A and C during the peak hours.

# 4.5.6 Alternative 2 vs. No Build Alternative Comparison and Proposed Roadway Improvements

#### Intersection

Table 4.5-12 presents a comparison of Year 2040 No Build Alternative and Year 2040 Alternative 2 operating conditions anticipated for the study intersections. As shown in the table, the majority of the intersections with an "Exceed Evaluation" are projected to operate with LOS F during the AM/PM peak hour under the No-Build Alternative. These intersections under Alternative 2 are projected to operate with LOS F during the AM/PM peak hour but with an increase in the D/C ratio.

Based on the comparison analysis, the following roadway improvements could be considered to improve intersections year 2040 operating conditions:

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Willow Street and Bellflower Boulevard intersection (during PM peak hour and under No-Build Alternative projected D/C ratio is 1.09 and LOS F, and under Alternative 2 projected D/C ratio is 1.25 and LOS F).

- Add an exclusive right-turn lane to eastbound approach; and
- Add a 2<sup>nd</sup> left-turn lane to westbound approach.

As shown on Figure 4.5-5, these proposed roadway improvements could be accommodated within the existing right-of-way.

Willow Street and Los Coyotes Diagonal Intersection (during PM peak hour and under No-Build Alternative projected D/C ratio is 1.18 and LOS F, and under Alternative 2 projected D/C ratio is 1.41 and LOS F).

- Add a 2<sup>nd</sup> left-turn lane to eastbound approach; and
- Add a 2<sup>nd</sup> left-turn lane to southbound approach.

As shown on Figure 4.5-6, these proposed roadway improvements could be accommodated within the existing right-of-way.

Willow Street and Woodruff Avenue intersection (during AM peak hour and under No-Build Alternative projected D/C ratio is 1.44 and LOS F, and under Alternative 2 projected D/C ratio is 1.53 and LOS F).

Add a 2<sup>nd</sup> left-turn lane to northbound approach.

As shown on Figure 4.5-7, this proposed roadway improvement could be accommodated within the existing right-of-way.

SR-22 westhound on/off Ramp and College Park Drive Intersection (during PM peak hour and under No-Build Alternative projected D/C ratio is <u>1.16 and LOS F</u>, and under Alternative 2 projected D/C ratio is <u>1.24 and LOS F</u>).

- Widen SR-22 westbound On/Off Ramp from one lane to two lanes approximately 200 feet east of the intersection extending to Studebaker Road as shown on the figure below.
   This roadway improvement could be accommodated with existing right-of-way; and
- Provide a traffic signal to control traffic movements instead of existing one-way stop control placed at the westbound College Park Drive.

As shown on Figure 4.4-5, these proposed roadway improvements could be accommodated within the existing right-of-way.

7<sup>th</sup> Street and Pacific Coast Highway intersection (during PM peak hour and under No-Build Alternative projected D/C ratio is 1.03 and LOS F, and under Alternative 2 projected D/C ratio is 1.07 and LOS F).

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Add an exclusive right-turn lane to northbound approach.

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As shown on Figure 4.5-8, this proposed roadway improvement could be accommodated within the existing right-of-way.

7<sup>th</sup> Street and Beliflower Boulevard intersection (during AM peak hour and under No-Build Alternative projected D/C ratio is 1.13 and LOS F, and under Alternative 2 projected D/C ratio is 1.18 and LOS F).

Add an exclusive right-turn lane to westbound approach.

As shown on Figure 4.5-9, this proposed roadway improvement could be accommodated within the existing right-of-way.

7<sup>th</sup> Street and West Campus Drive intersection (during AM peak hour and under No-Build Alternative projected D/C ratio is <u>0.85 and LOS D</u>, and under Alternative 2 projected D/C ratio is <u>0.89 and LOS E</u>).

Add an exclusive right-turn lane to westbound approach.

As shown on Figure 4.5-10, the proposed roadway improvement could be accommodated within the existing right-of-way.

7<sup>th</sup> Street and East Campus Drive intersection (during AM peak hour and under No-Build Alternative projected D/C ratio is 1.12 and LOS F, and under Alternative 2 projected D/C ratio is 1.17 and LOS F).

Add a right-turn lane to westbound approach.

As shown on Figure 4.5-11, the proposed roadway improvement could be accommodated within the existing right-of-way.

Table 4.5-11 presents a comparison of Year 2020 No Build Alternative and Year 2020 Alternative 2 operating conditions anticipated for the study intersections. As shown in the table, roadway improvements for four (4) intersections (out of the eight listed above) are necessary by year 2020 <u>under both the No-Build Alternative and Alternative 2</u> to improve intersections operating condition that are projected to operate at LOS F during the AM/PM peak hour.

Table 4.5-12 shows intersections LOS and D/C ratio during AM and PM peak hours for Year 2040 Alternative 2 with recommended roadway improvements.

#### Freeway Mainline

Table 4.5-13 presents a comparison of 2020 No Build and 2020 Alternative 2 operating conditions anticipated for the mainline freeway segments. The table shows that there is an increase in the D/C ratio from the No Build Alternative to Alternative 2 in many segments, with the range of increase in the GP lanes from 0.01 to 0.18 during peak hours. Higher levels of increase are generally found closer to the limits of the project improvements and diminish with increasing distance from those limits. There are several segments in which there is a decrease in the D/C ratio, shown in red on Table 4.5-13. Those segments that are anticipated to have a change in LOS are identified in the Evaluation column in the table.

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Table 4.5-14 presents a comparison of 2040 No Build and 2040 Alternative 2 operating conditions anticipated for the mainline freeway segments. The table shows that there is an increase in the D/C ratio from the No Build Alternative to Alternative I in many segments, with the range of increase in the GP lanes from 0.01 to 0.19 during peak hours. Higher levels of increase are generally found closer to the limits of the project improvements and diminish with increasing distance from those limits. There are several segments in which there is a decrease in the D/C ratio, shown in red on Table 4.5-14. Those segments that are anticipated to have a change in LOS are identified in the Evaluation column in the table.

#### 4.6 Alternative 3 Conditions

This section of the report provides an analysis of the study intersections and mainline freeway as well as the freeway/ramp junction locations for years 2020 and 2040 Alternative 3 conditions. Alternative 3 condition analyses are based on forecasted years 2020 and 2040 Alternative 3 traffic volumes and year 2009 traffic control/lane geometries at the study intersections and freeway segments and ramps within the project limits. As discussed in Section 4.1, geometric conditions and type of traffic control for years 2020 and 2040 are assumed to be unchanged from existing conditions (Year 2009). Intersection analysis worksheets for years 2020 and 2040 Alternative 3 conditions are provided in Appendix IX.A. Freeway analyses worksheets for years 2020 and 2040 Alternative 3 conditions are provided in Appendix IX.B.

#### 4.6.1 Alternative 3 Traffic Volumes

Year 2020 Alternative 3 intersection peak hour traffic volumes are presented in Figure 4.6-1. Year 2040 Alternative 3 intersection peak hour traffic volumes are presented in Figure 4.6-2. Years 2020 and 2040 Alternative 3 peak hour traffic volumes for the I-405 mainline, I-605 mainline and SR-22/7<sup>th</sup> Street mainline and all interchange ramps within the study area are illustrated in Figures 4.6-3 and 4.6-4, respectively.

#### 4.6.2 Alternative 3 (Year 2020) Intersection Traffic Analysis

A summary of LOS for AM and PM peak hours for year 2020 Alternative 3 conditions, including traffic control at study intersections, is provided in **Table 4.6-1**. The LOS analysis conducted for year 2020 Alternative 3 conditions indicates that all study intersections are anticipated to operate at LOS D or better during the AM and PM peak hours except for the following intersections that are anticipated to operating at LOS E or F during the AM or PM peak hours:

- Willow Street/Bellflower Boulevard (PM LOS = E and D/C = 1.15)
- Willow Street/Los Coyotes Diagonal (PM LOS = E and D/C = 1.26)
- Willow Street/Woodruff Avenue (AM LOS = F and D/C = 1.30)
- I-405 SB Direct Off-Ramp/Studebaker Rd (AM LOS = F and D/C = 1.04)
- SR-22 WB On/Off-Ramp/College Park Dr (PM LOS = F and D/C = 0.32)
- 7th Street/Bellflower Boulevard (AM LOS = E and D/C = 1.09)

A comparison of year 2020 Alternative 3 vehicle queuing (AM and PM peak hour 95th percentile queues) and available queue storage (in feet) is included in **Table 4.6-2**. During the peak hours,

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most of the turn pockets at the arterial intersections are anticipated to provide sufficient queue storage except at the following locations:

- Carson Street/Pioneer Boulevard
  - Northbound left turn lane
  - Eastbound left turn lane
- · Willow Street/Bellflower Boulevard
  - Northbound left turn lane
  - Southbound left turn lane
  - Eastbound left turn lane
  - Westbound left turn lane
- Los Coyotes Diagonal/Bellflower Boulevard
  - Eastbound left turn lane
  - Westbound left turn lane
- Willow Street/Los Covotes Diagonal
  - Southbound left turn lane
  - Westbound left turn lane
- Willow Street/Woodruff Avenue
  - Northbound left turn lane
  - Southbound left turn lane
  - Southbound right turn lane
  - Eastbound left turn lane
  - Westbound left turn lane
- Stearns Street/Palo Verde
   Northbound left turn lane
  - Southbound left turn lane
  - Eastbound left turn lane
  - Westbound left turn lane
- Atherton Street/Studebaker Road
  - Eastbound left turn lane
- SR-22 EB On/Off-Ramp/Studebaker Road
  - Northbound right turn lane
  - Southbound left turn lane
- 7<sup>th</sup> Street/Pacific Coast Highway
- Southbound left turn lane
   7th Street/Bellflower Boulevard
  - Southbound left turn lane
  - Southbound left turn lane
     Southbound right turn lane
  - Eastbound left turn lane
- Pacific Coast Highway/Bellflower Boulevard
  - Southbound left turn lane
  - Eastbound left turn lane
- 7<sup>th</sup> Street/W. Campus Drive
  - Southbound left/right turn lane
- 7<sup>th</sup> Street/E. Campus Drive

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- Southbound left turn lane
- Eastbound left turn lane

The freeway off-ramp vehicle quening is also shown in Table 4.6-2. During the peak hours, two freeway off-ramp locations are anticipated to exceed the available storage length under year 2020 Alternative 3 conditions:

- Carson Street/I-605 SB Off-Ramp
  - Southbound left turn lane
- SR-22 EB On/Off-Ramp/Studebaker Road
  - Westbound right turn lane

#### 4.6.3 Alternative 3 (Year 2040) Intersection Traffic Analysis

A summary of LOS for AM and PM peak hours for year 2040 Alternative 3 conditions, including traffic control at study intersections, is provided in Table 4.6-3. The LOS analysis conducted for year 2040 Alternative 3 conditions indicates that all study intersections are anticipated to operate at LOS D or better during the AM and PM peak hours except for the following intersections that are are anticipated to operate at LOS E or F during the AM or PM peak hours:

- Willow Street/Bellflower Boulevard (PM LOS = F, D/C = 1.25)
- Los Coyotes Diagonal/Bellflower Boulevard (PM LOS = E, D/C = 1.22)
- Willow Street/Los Coyotes Diagonal (PM LOS = F and D/C = 1.41)
- Willow Street/Woodruff Avenue (AM LOS = F and D/C = 1.40)
- I-405 SB Direct Off-Ramp/Studebaker Rd (AM LOS = F and D/C = 1.20)
- SR-22 WB On/Off-Ramp/College Park Dr (PM LOS = F and D/C = 0.45)
- 7th Street/Pacific Coast Highway (AM LOS = E and D/C = 1.04)
- 7th Street/Bellflower Boulevard (AM LOS = E and D/C = 1.17; PM LOS = E and D/C = 1.10)
- 7th Street/W. Campus Drive (AM LOS = E and D/C = 0.87; PM LOS = E, D/C = 0.93)
- 7th Street/E. Campus Drive (AM LOS = E and D/C = 1.14)

A comparison of year 2040 Alternative 3 vehicle queuing (AM and PM peak hour 95<sup>th</sup> percentile queues) and available queue storage (in feet) is included in **Table 4.6-4**. During the peak hours, most of the turn pockets at the arterial intersections are anticipated to provide sufficient queue storage except at the following locations:

- Carson Street/Pioneer Boulevard
  - Northbound left turn lane
  - Eastbound left turn lane
- Willow Street/Lakewood Boulevard
  - Westbound left turn lane
- Willow Street/Bellflower Boulevard
  - Northbound left turn lane
  - Southbound left turn lane
  - Eastbound left turn lane

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- Westbound left turn lane
- Los Coyotes Diagonal/Bellflower Boulevard
  - Eastbound left turn lane
  - Westbound left turn lane
- · Willow Street/Los Coyotes Diagonal
  - Southbound left turn lane
  - Westbound left turn lane
- · Willow Street/Woodruff Avenue
  - Northbound left turn lane
  - Southbound left turn lane
  - Southbound right turn lane
     Eastbound left turn lane
  - Westbound left turn lane
- Steams Street/Palo Verde
  - Northbound left turn lane
  - Eastbound left turn lane
  - Westbound left turn lane
- Atherton Street/Studebaker Road
  - Eastbound left turn lane
- SR-22 WB On/Off-Ramp/Studebaker Road
  - Southbound right turn lane
- SR-22 EB On/Off-Ramp/Studebaker Road
  - Northbound right turn lane
     Southbound left turn lane
- 7<sup>th</sup> Street/Pacific Coast Highway
  - Southbound left turn lane
- 7th Street/Bellflower Boulevard
  - Southbound left turn lane
  - Southbound right turn lane
  - Eastbound left turn lane
- Pacific Coast Highway/Bellflower Boulevard
  - Southbound left turn lane
  - Eastbound left turn lane
- 7<sup>th</sup> Street/W. Campus Drive
- Southbound left/right turn lane
- 7th Street/E. Campus Drive
  - Southbound left turn lane
  - Eastbound left turn lane

The freeway off-ramp vehicle queuing is also shown in Table 4.6-4. During the peak hours, two freeway off-ramp locations are anticipated to exceed the available storage length under year 2040 Alternative 3 conditions:

- Carson Street/I-605 SB Off-Ramp
  - Southbound left turn lane

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- SR-22 EB On/Off-Ramp/Studebaker Road
  - Westbound right turn lane

#### 4.6.4 Alternative 3 (Year 2020) Freeway Traffic Analysis

Findings for the northbound and southbound freeway segments under Alternative 3 conditions for year 2020 are summarized in Table 4.6-5. The peak hour capacity, demand volume, D/C ratio, density and LOS for all the freeway segments are shown.

Under Alternative 3 conditions for year 2020, the I-405 freeway mainline segments are projected to operate at either LOS E or F during the AM and PM peak hours in both directions except at one location. The I-405 southbound segment between Studebaker Road to I-605 northbound offramp which is projected to operate at LOS D during the AM peak hour. Majority of the northbound and southbound I-405 HOV lanes are anticipated to operate at over-capacity during the AM or PM peak hours under year 2020 Alternative 3 conditions with D/C ratios ranging from 1.04 to 1.24.

Under Alternative 3 conditions for year 2020, the I-605 freeway mainline segments are projected to operate between LOS B and LOS D during the AM and PM peak hours in both directions except for the segment between Carson Street and Spring Street, which southbound movement is anticipated to operate at LOS E during both the AM and PM peak hour.

Under Alternative 3 conditions for year 2020, the SR-22/T<sup>th</sup> Street freeway mainline segment between Pepper Tree Lane and Studebaker Road, is anticipated to operate at LOS B or LOS C during the AM and PM peak hours in both directions, while the segment between Studebaker Road and I-605, is anticipated to operate from LOS D to LOS F during the AM and PM peak hours in both directions.

#### Ramps and Ramp-Freeway Junction Analysis and Levels of Service

The density and LOS for each of the ramps along I-405, I-605 and SR-22/7<sup>th</sup> Street within the study area for Alternative 3 are based on projected year 2020 Alternative 3 traffic volumes. Table 4.6-6 provide a summary of the findings from the analyses for year 2020 Alternative 3 conditions during the AM and PM peak hours. The peak hour capacity, demand volume, D/C ratio, density, and LOS for each of the freeway ramps are presented.

Under Alternative 3 conditions for year 2020, the projected LOS for the I-405 ramp junctions generally ranges from LOS B to LOS F, depending upon time of day and direction of travel. For the I-605 ramp junctions, the peak hour LOS generally ranges from LOS A to LOS E, depending upon time of day and direction of travel. The peak hour LOS expected for the SR-22/7 Street ramp junctions, generally ranges from LOS A to LOS F, depending upon time of day and direction of travel.

The freeway-to-freeway branch connectors are anticipated to operate at under-capacity during both AM and PM peak hours except at two locations. The D/C ratio for the branch connector from I-605 southbound to 7<sup>th</sup> Street/I-405 is anticipated to be 1.35 and 1.25 during the AM and PM peak hours, respectively. The branch connector from I-605 southbound/I-405 southbound to

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7th Street is expected to have D/C ratios of 1.12 and 1.07 during the AM and PM peak hour, respectively.

#### Weaving Analysis

Weaving analysis was conducted between on-ramps and off-ramps spaced less than 2,500 feet apart. Separate analyses were conducted, as appropriate, for freeways and C-D roads. Weaving analysis for Alternative 3 is based on projected year 2020 Alternative 3 traffic volumes. **Table 4.6-7** summarizes the weaving analysis findings for year 2020 conditions for Alternative 3 for both the freeway segments and the C-D roads. The density and LOS for all the weaving sections are shown.

Under year 2020 Alternative 3 condition, the I-405 freeway weaving segments are anticipated to operate at LOS E or LOS F during the peak hours except at one location during the AM peak hour. The I-405 southbound freeway weaving segment between Palo Verde Avenue/Stearns Street and Studebaker Road is expected to operate at LOS D during the AM peak hour. Weaving analysis was conducted for the C-D roads at the Lakewood Boulevard/Willow Street interchange and the Bellflower Boulevard/Los Coyotes Diagonal interchange. The analysis shows that the weaving segments on the C-D roads are anticipated to operate between LOS A and C during the peak hours.

#### 4.6.5 Alternative 3 (Year 2040) Freeway Traffic Analysis

Findings for the northbound and southbound freeway segments under Alternative 3 conditions for year 2040 are summarized in Table 4.6-8. The peak hour capacity, demand volume, D/C ratio, density and LOS for all the freeway segments are shown.

Under Alternative 3 conditions for year 2040, the I-405 freeway mainline segments are projected to operate at either LOS E or F during the AM and PM peak hours in both directions. The northbound and southbound I-405 HOV lanes within the project limits are anticipated to operate at over-capacity during the AM or PM peak hours under year 2040 Alternative 3 conditions with D/C ratios ranging from 1.02 to 1.34.

Under Alternative 3 conditions for year 2040, the I-605 freeway mainline segments are anticipated to operate between LOS B and LOS D during the AM and PM peak hours in both directions except for the freeway segment between Carson Street and Spring Street. The southbound I-605 freeway segment between Carson Street and Spring Street is anticipated to operate at LOS F during the AM and PM peak hours.

Under Alternative 3 conditions for year 2040, the SR-22/Tth Street freeway mainline segment between Pepper Tree Lane and Studebaker Road, is anticipated to operate at LOS B or LOS C during the AM and PM peak hours in both directions, while the segment between Studebaker Road and I-605, is anticipated to operate between LOS D to LOS F during the AM and PM peak hours in both directions.

#### Ramps and Ramp-Freeway Junction Analysis and Levels of Service

The density and LOS for each of the ramps along I-405, I-605 and SR-22/7th Street within the study area for Alternative 3 are based on projected year 2040 Alternative 3 traffic volumes.

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Table 4.6-9 provide a summary of the findings from the analysis for year 2040 Alternative 3 conditions during the AM and PM peak hours. The peak hour capacity, demand volume, D/C ratio, density, and LOS for each of the freeway ramps are presented.

Under Alternative 3 conditions for year 2040, the projected LOS for the I-405 ramp junctions generally ranges from LOS D to LOS F, depending upon time of day and direction of travel. For the I-605 ramp junctions, the peak hour LOS generally ranges from LOS A to LOS F, depending upon time of day and direction of travel. The ramp junctions along SR-22/7<sup>th</sup> Street are anticipated to operate at LOS D and F, depending upon time of day and direction of travel.

The freeway-to-freeway branch connectors are anticipated to operate at under-capacity during both AM and PM peak hours except at two locations. The D/C ratio for the branch connector from I-605 southbound to 7th Street/I-405 is anticipated to be 1.46 and 1.35 during the AM and PM peak hours, respectively. The branch connector from I-605 southbound/I-405 southbound to 7th Street is expected to have D/C ratios of 1.12 and 1.07 during the AM and PM peak hour.

#### Weaving Analysis

Weaving analysis was conducted between on ramps and off-ramps spaced less than 2,500 feet apart. Separate analyses were conducted, as appropriate, for freeways and C-D roads. Weaving analysis for Alternative 3 is based on projected year 2040 Alternative 3 traffic volumes. Table 4.6-10 summarizes the weaving analysis findings for year 2040 conditions for Alternative 3 for both the freeway segments and the C-D roads.

For year 2040 conditions, the mainline freeway weaving segments are projected to operate at LOS E or LOS F during the peak hours. Weaving analysis was conducted for the C-D roads at the Lakewood Boulevard/Willow Street interchange and the Bellflower Boulevard/Los Coyotes Diagonal interchange. The analysis shows that the weaving segments on the C-D roads are anticipated to operate between LOS A and C during the peak hours.

# 4.6.6 Alternative 3 vs. No Build Alternative Comparison and Proposed Roadway Improvements

#### Intersection

Table 4.6-12 presents a comparison of Year 2040 No Build Alternative and Year 2040 Alternative 3 operating conditions anticipated for the study intersections. As shown in the table, the majority of the intersections with an "Exceed Evaluation" are projected to operate with LOS F during the PM peak hour under the No-Build Alternative. These intersections under Alternative 3 are projected to operate with LOS F during the AM/PM peak hour but with an increase in the D/C ratio.

Based on the comparison analysis, the following roadway improvements could be considered to improve intersections year 2040 operating conditions:

Willow Street and Bellflower Boulevard intersection (during AM peak hour and under No-Build Alternative projected D/C ratio is <u>1.09 and LOS F</u>, and under Alternative 2 projected D/C ratio is <u>1.25 and LOS F</u>).

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- Add an exclusive right-turn lane to eastbound approach; and
- Add a 2<sup>nd</sup> left-turn lane to westbound approach.

As shown on Figure 4.5-5, these proposed roadway improvements could be accommodated within the existing right-of-way.

Los Coyotes Diagonal and Bellflower Boulevard intersection (during AM peak hour and under No-Build Alternative projected D/C ratio is <u>1.13 and LOS F</u>, and under Alternative 2 projected D/C ratio is <u>1.22 and LOS F</u>).

Add a 2<sup>nd</sup> left-turn lane to eastbound approach.

As shown on Figure 4.6-5, this proposed roadway improvement could be accommodated within the existing right-of-way.

Willow Street and Los Coyotes Diagonal intersection (during AM peak hour and under No-Build Alternative projected D/C ratio is 1.18 and LOS F, and under Alternative 2 projected D/C ratio is 1.41 and LOS F).

- Add a 2<sup>nd</sup> left-turn lane to eastbound approach; and
- Add a 2<sup>nd</sup> left-turn lane to southbound approach.

As shown on Figure 4.5-6, these proposed roadway improvements could be accommodated within the existing right-of-way.

7<sup>th</sup> Street and Bellflower Boulevard intersection (during AM peak hour and under No-Build Alternative projected D/C ratio is <u>1.06 and LOS F</u>, and under Alternative 2 projected D/C ratio is 1.10 and LOS F).

Add an exclusive right-turn lane to westbound approach.

As shown on Figure 4.5-9, this proposed roadway improvement could be accommodated within the existing right-of-way.

Table 4.6-11 presents a comparison of Year 2020 No Build Alternative and Year 2020 Alternative 3 operating conditions anticipated for the study intersections. As shown in the table, roadway improvements for three intersections (out of the four listed above) are necessary by year 2020 under both the No-Build Alternative and Alternative 3 to improve intersections operating condition that are projected to operate at LOS F during the AM/PM peak hour.

Table 4.6-12 shows intersections LOS and D/C ratio during AM and PM peak hours for Year 2040 Alternative 3 with recommended roadway improvements.

#### Freeway Mainline

Table 4.6-13 presents a comparison of 2020 No Build and 2020 Alternative 3 operating conditions anticipated for the mainline freeway segments. The table shows that there is an increase in the D/C ratio from the No Build Alternative to Alternative 3 in many segments, with the range of increase in the GP lanes from 0.03 to 0.34 during peak hours. Higher levels of increase are generally found closer to the limits of the project improvements and diminish with

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increasing distance from those limits. There are several segments in which there is a decrease in the D/C ratio, shown in red on Table 4.6-13. Those segments that are anticipated to have a change in LOS are identified in the Evaluation column in the table.

Table 4.6-14 presents a comparison of 2040 No Build and 2040 Alternative 3 operating conditions anticipated for the mainline freeway segments. The table shows that there is an increase in the D/C ratio from the No Build Alternative to Alternative 3 in many segments, with the range of increase in the GP lanes from 0.02 to 0.37 during peak hours. Higher levels of increase are generally found closer to the limits of the project improvements and diminish with increasing distance from those limits. There are several segments in which there is a decrease in the D/C ratio, shown in red on Table 4.6-14. Those segments that are anticipated to have a change in LOS are identified in the Evaluation column in the table.

#### 4.6.7 Transition Areas

This section summarizes the LOS expected in the transition areas associated with the Express Lanes in Alternative 3. Transition areas are along the freeways at the beginning and end of the Express Lanes and allow traffic in HOV and GP lanes to change lanes, if necessary, to access the GP and Express Lanes or vice versa. Transition areas may add new lanes and/or redesignate lanes from HOV to Express. The two proposed transition areas located within the study limits are as follows:

- 1. On I-605 at the I-405 interchange; and
- 2. On I-405 at the I-605 interchange.

Limits of transition areas approaching the start of the Express Lanes are defined upstream by the termination of an HOV restriction and downstream by the solid striping used to delineate the separation between the Express Lanes and the general purpose lanes. Limits of the transition areas approaching the end of the Express Lanes are defined upstream by the termination of solid striping used to delineate the separation between the Express Lanes and the general purpose lanes and the beginning of the downstream HOV access restriction.

The transition areas are anticipated to operate at a level similar to the level expected for the HOV and/or general purpose lanes in the vicinity of the transition area. The northbound transition area on I-405 from I-605 to the end of the HOV access is expected to operate at LOS F in year 2040. As shown in Table 4.6-8, the northbound GP and HOV lanes in the transition area on I-405 from HOV lanes.

The northbound transition area on I-605 from the termination of the direct connector separation to the end of the HOV access is expected to operate at LOS B and C during the AM and PM peak hours, respectively. **Table 4.6-8** shows that this segment of I-605 northbound is expected to operate at LOS B and C in the general purpose lanes during the AM and PM peak hours, respectively. In the southbound direction the transition area is expected to operate at LOS D during the AM and PM peak hours.

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Generally, the transition areas are anticipated to operate at a level similar to the level expected for the HOV and/or general purpose lanes in the vicinity of the transition area. Overall, the transition areas are not expected to degrade operations of the HOV system adjacent to the transition areas.

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_								_	
$\neg$	Loc	ation		_			2009) LOS		
10.	East/West Street	North/South Street	Traffic Control/Comments	V/C	Avg Delay (sec)	LOS	V/C	Avg Dulay (sec)	ur LO:
1	Carson St	1-605 SB Off Ramp	Existing Traffic Signal	0.58	21.9	С	0.61	17.8	В
Ĥ	001501111	I-605 SB Direct On Ramp	Unsignalized On Ramp	0.15			0.25	-	_
2 I	Carson St	I-605 SB Loop On Ramp	Unsignalized On Ramp	0.24	**		0.20		-
	0.000.141	I-605 NB Off Ramp	Existing Traffic Signal	0.55	14.8	В	0.66	12.4	
- 1	ŀ	1-605 NB Loop On Ramp	Unsignalized On Ramp	0.23			0.45	-	_
3	Carson St	I-GOS NB Direct On Ramp	Unsignalized On Ramp	0.40		_	0.32		
4	Carson St	Pioneer Blvd	Existing Traffic Signal	0.76	48.1	D	0.76	35.1	
5	Spring St/Cerritos Ave	I-60S SB Off Ramp	Existing Traffic Signal	0.79	26.2	С	0.60	18.4	e
6	Spring St/Cerritos Ave	I-605 NB On Ramp	Existing Traffic Signal	0.84	13.5	В	0.81	11.1	В
•	1-405 NB Direct Off Ramp	1-003110 01110110	Unsignalized Off Ramp	0.35	-		0.34	-	-
ŀ	I-405 NB Direct On Ramp		Unsignalized On Ramp	0.22	-		0.21	-	-
ŀ			Unsignalized Off Ramp	0.19			0.18		٦.
., }	I-405 NB Loop Off Ramp	Lakewood Blvd	Unsignalized On Ramp	0.50	_		0.38		-
7	I-405 NB Loop On Ramp	Lakewood bry	Unsignalized On Ramp	0.19	-	_	0.23	_	٦.
_ }	I-405 SB Loop On Ramp	t-t	Unsignalized Off Ramp	0.40			0.31		
8	I-405 S8 Direct Off Ramp	Lakewood Blvd		0.76	31,1	c	0.92	66.2	-
9	Willow St	Lakewood Blvd	Existing Traffic Signal	0.32	31,1	-	0.30	- 002	-
- 1		I-405 SB Loop Off Ramp	Unsignalized Off Ramp		-	-	0.38		-
10	Willow St	I-405 SB Direct On Ramp	Unsignalized On Ramp	0.26			0.48	11.9	
Į	1-405 NB Off Ramp		Existing Traffic Signal	0.41	93	<u>A</u>			
- 1	I-405 NB Loop On Ramp		Unsignalized On Ramp	D.49			0.35	-	
11	I-405 NB Olrect On Ramp	Bellflower Blvd	Unsignalized On Ramp	0.28	_::_		0.18	-	
12	Willow St	Bellflower Blvd	Existing Traffic Signal	D.84	81.2	F	0.92	40.1	-
		Beliflower Blvd	Existing Traffic Signal	0,63	31.3	c	0.97	72.8	
13	Los Coyotes Diagonal	-405 SB Direct On Ramp	Unsignalized On Ramp	0.06	-		0.09		Ŀ
14	I-405 SB Loop Off Ramp	Beilflower Blvd	Unsignalized On Ramp	0.12		-	0.26		-
$\neg$		I-405 SB Direct Off Ramp	Existing Traffic Signal	0.44	14.4	В	0.45	13.4	-
15	Los Coyotes Diagonal	I-405 SB Loop On Ramp	Unsignalized On Ramp	0.14			0.13		_
16	Willow St	Los Coyotes Diagonal	Existing Traffic Signal	0.72	51.5	D	0.74	102.8	. 1
17	WillowSt	Woodruff Ave	Existing Traffic Signal	1,07	86.8	F	0.77	30.4	- (
	I-405 NB Direct Off Ramp		Unsignalized Off Ramp	0.15	_	-	0.17		
18	I-405 NB Direct On Ramp	Woodruff Ave	Unsignalized On Ramp	0.25			0.20	-	
	I-405 SB Direct Off Ramp		Unsignalized Off Ramp	0.48		-	0.38	***	-
19	1-405 SB Direct On Ramp	Woodruff Ave	Unsignalized On Ramp	0.27			0.19	-	_
	I-405 NB Direct Off Ramp		Existing Traffic Signal	0.54	11.3	В	0,45	13.7	
20	I-405 NB Loop On Ramp	Palo Verde	Unsignalized On Ramp	0.11	-		0.20	-	
21	Woodruff Ave	Palo Verde	Existing Traffic Signal	0.87	86.6	F	0.59	21.3	
22	Stearns St	Palo Verde	Existing Traffic Signal	0.73	19.4	В	0.75	25.2	
23	Stearns St	I-405 SB Direct On Ramp	Unsignalized On Ramp	0.28	-		0.39	_	
24	I-405 NB Direct On Ramp	Studebaker Rd	Existing Traffic Signal	0.50	4.0	A	0.55	4.3	
25	I-405 SB Direct Off Ramp	Studebaker Rd	Unsignalized Intersection	0.15	13.8	В	0.04	10.8	1
26	Atherton St	Studebaker Rd	Existing Traffic Signal	0.46	9.2	A	0.74	23.3	
	SR-22 WB On/Off Ramp	Studebaker Rd	Existing Traffic Signal	0.45	16.0	B	0.74	22.1	
27		Studebaker Rd	Existing Traffic Signal	0.72	17.6	8	0.82	17.1	
28	SR-22 EB On/Off Ramp		Unsignalized Intersection	0.39	18.8	c	0.65	59.9	
29	SR-22 WB On/Off Ramp	College Park Dr	Existing Traffic Signal	0.39	92.9	F	1.03	82.6	
30	7th St	Pacific Coast Highway		1.01	73.6	E	0.91	90.3	$\vdash$
31	7th St	Betiflower Blvd	Existing Traffic Signal	0.47	22.3	c	0.73	22.5	
32	Pacific Coast Highway	Bellflower Blvd	Existing Traffic Signal			-	0.73	30.3	_
33	7th St	Channel Dr	Existing Traffic Signal Existing Traffic Signal	0.72	32.9	F	0.88	31.1	
34	7th St	W. Campus Dr							

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	Lor	ation				Existing Page	9) Conditions	
					AM Pe	ek Hour		ak Hour
No.	East/West Street	North/South Street	Movement	Available Storage (ft)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No
			SBL	300	168	Yes	255	Yes
1	Carson St	1-605 SB Off Ramp	SBT	1,130	128	Yes	180	Yes
_			SBR	300	273	Yes	225	Yes
3	Carson St	I-605 NB Off Ramp	NBL	300 (650)	165	Yes	144	Yes
-	-	1 des tes on regrep	NBR	300(1175)	178	Yes	207	Yes
			NBL	120	363	No	296	No
			SBL	140	59	Yes	65	Yes
4	Carson St	Pioneer Blvd	SBR	140	80	Yes	61	Yes
		ľ [	EBL	250	214	Yes	251	No
			WBL	80	17	Yes	17	Yes
5	Spring St/Cerritos Ave	I-SOS SB Off Ramp	SBL	220 (1240)	250	Yes	274	Yes
		- www an on hamp	SBR	300	482	Yes	314	Yas
6	Spring St/Cerritos Ave	I-605 NB On Ramp	WBL	260	247	Yes	258	Yes
			NBL	130	91	Yes	91	Yes
9	Willow St	Lakewood Blvd	SBL	150	48	Yes	129	Yes
-	William 20	Lakewood Bivd	EBL	175	70	Yes	151	Ves
			WBL	150	36	Yes	80	Yes
			WBL	1,870	123	Yes	184	Yes
11	I-405 NB Off Ramp	Beliflower Blvd	WBL/T/R	1,130	71	Yes	146	Yes
			WBR	410	47	Yes	80	Yes
			NSL	150	335	No	122	Yes
	1110		SBL	120	109	Yes	125	No
12	Willow St	Beliffower Blvd	EBL	140	159	No	280	No
			WBL	110	160	No	128	No
			NBL	160	23	Yes	61	Yes
			NBR	230	49	Yes	244	
13	Los Coyotes Diagonal	Beilflower Blvd -	EBL	190	222	No	307	No
		i :	WBL	150	134	Yes	245	No
15	Los Coyotes Diagonal	I-405 SB Direct Off Ramp	SBL	1525 (500)	258	Yes	245	No
		T 465 65 Briter Bri realing	SBL	120	18	Yes	240	Yes
16	WillowSt	Los Coyotes Diagonal	EBL	140	151	No.	307	Yes
		ans doyotes biagoina	WBL	160				No
-		-	NBL I	140	376	No	452	No
			NBR	50	31	No Yes	118	Yes
			SBL	120	298	Yes No	109	Yes
17	Willow St	Woodruff Ave	SBR	120	61			Yes
		-	EBL	200	170	Yes	36	Yes
		-	WBL	180	370	Yes No	284	Yes
			WBL.	550				No
20	I-405 NB Direct Off Ramp	Palo Verde	WBT/R	1.155	53	Yes	335	Yes
			EBL EBL	335		Yes	55	Yes
21	Woodruff Ave	Palo Verde -	EBR	335	735	Yes	201	Yes
_			NBL	130	104	No (	408	No
			SBL SBL			Yes	132	No
22	Stearns St	Palo Verde	58L E8L	120	138	No	396	No
- 1		-		90	101	No	158	No
			WBL	80	80	No	57	Yes
24	1-405 NB Direct On Ramp	Studebaker Rd -	NBL.	100	95	Yes	124	No
_			SBR	70	19	Yes	16	Yes

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	Loca	tion			T	Existing (200)		
	1			1000000	AM Pe	ak Hour	PM Pe	ak Hour
No.	East/West Street	North/South Street	Movement	Available Storage (ft)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No
			NBL.	200	49	Yes	54	Yes
			SBL	260	- 4	Yes	10	Yes
26	Atherton St	Studebaker Rd	SBR	70	60	Yes	47	Yes
			EBL	120	106	Yes	410	No
- 37.5			WBL	220	40	Yes	31	Yes
			NBR	150	31	Yes	20	Yes
27	SR-22 WB On/Off Ramp	Studebaker Rd	SBL	200	55	Yes	76	Yes
-			NBR	300	453	No	430	No
28	SR-22 EB On/Off Ramp	Studebaker Rd	SBL	150	139	Yes	94	Yes
			WBR	60	22	Yes	24	Yes
	-		NSL.	330	1.87	Yes	259	Yes
30	7th St	Pacific Coast Highway	SBL	290	195	Yes	285	Yes
			NBR	130	108	Yes	136	No
			SBL	160	125	Yes	255	No
31	7th St	Bellflower Blvd	SBR	160	86	Yes	400	No
			EBL	200	390	No	321	No
			WBL	200	53	Yes	120	Yes
-			NBL	280	114	Yes	88	Yes
			SEL	240	22	Yes	16	Yes
orea.	Service Control	100000000000000000000000000000000000000	SBR	50	1	Yes	0	Yes
32	Pacific Coast Highway	Beliflower Blvd	EBL	110	4	Yes	60	Yes
			WBL	120	42	Yes	234	No
			WBR	200	. 46	Yes	45	Yes
_			EBL	270	203	Yes	33	Yes
33	7th St	Channel Dr	EBR	180	2	Yes	14	Yes
-			WBL	280	82	Yes	371	No
2015			SBL/R	150	52	Yes	205	No
34	7th St	W. Campus Dr	EBL	400	261	Yes	128	Yes
-		-	SBL	150	79	Yes	208	No
		W 65	SBT/R	150	70	Yes	142	Yes
35	7th St	E. Campus Dr	EBL	150	172	No	113	Yes
			WBL	300	76	Yes	109	Yes

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	1			feinline			Exist	ng (200	9] Conditia	ns		
	Lane					AM P	eak Hour	_	İ	PM Pe	ak Hour	_
Location	Type	Direction	Lanes	Capacity <sup>14</sup>	Traffic Demand Volume <sup>2</sup>	v/c	Density <sup>2,5</sup>	ros,	Traffic Demand Volume <sup>1</sup>	v/c	Density <sup>2,5</sup>	LOS
				1-4-25 Malnk								
	GP	NB	5	9,250	9,795	105	43.7	E	8,566	0.94	33.5	D
Temple Avenue to		SB	5	9,250	5,199	0.99	32.6	D	8,322	0.90	34.4	9
Lakewood Boulevard/Willow Street	HDV	NB	1	1,650	1,746	1.06	-	-	1,222	0.74		=
		SB	1	1,650	778	0,47		-	1,599	0.97		
	GP.	NB	5	9,250			Weaving Seg					
Lakewood Boulevard/Willow Street to	<u> </u>	58	5	9,250			Weaving Seg	ment - I		ne Tabl	e	
Bellflower Boulevard	HOV	NB	1	1,650	1,745	1.06	-	-	1,222	0.74		
	HEAV	56	1	1,650	779	2,47	-		1,599	0.97		
	GP	NB	5 .	9,250	100		Whaving Seg					
Belfflower Boulevard to	- Gr	SB	5	9,250			Weaving Seg	mont I	Acfer to Wes	we Tabi	e	
Woodruff Avenue	HOV	NB	2	1,650	1,720	1.04			1,182	0.72	-	-
	HOV	\$8	1	1,650	783	3,47	T	-	1,570	0.95	-	_
* 10	GP	NB	5	9,250		_	Weavey Seg	ment - F	Refer to Wes	we Tabl		
Woodruff Avenue to	(aP	SB	4	7,400	7,937	1.07	39.7	E	7,175	0.97	37.7	
Palo Verde Avenue/Steams Street	HOV	NB	1	1,650	1,729	1.04	_	-	1,182	0.72	-	-
	NOV	SB	1	1,650	793	0.48	-	-	1,710	1.04	_	
		NB	5	9,250			Waaving Seg	ment - !	Acfer to Wes	we Tebi	c	
Palo Verde Avenue/Stearns Street to	GP	SB	5 1	9,250			Weaving Seg					
Studebaker Road		N6	1	1,659	1,720	3.04		-	1,182	0.72	_	-
	HOV	SR	1	1,850	880	0.50		_	2,550	0.95		-
		NB	4	7,480	7,240	0.98	187	F	5,030	0.81	26.9	0
Studebaker Road to	GP	SB	5 1	9.250	7,684	0.85	25.6		7.733	0.84	31.9	- 0
1-605 NB Off Ramp		NB	1	1,650	1,360	0.84	-	-	1,440	0.87		
	HCV	58	1	1,650	830	0.50		-	1,560	0.95	-	
		NB	4	7,400	7,240	0.98	18.7	F	5.030	0.81	26.9	D
I 505 NB Off Ramp to	GP	58	4	7,400	6 508	0.98	27.7	3	5,428	0.87	ks :	- 0
7th St Off Ramp		NB	3 1	1,650	1.380	0.84	47.7	-	1,440	0.87	55,4	- 0
7 di Si Si Halip	HQV	58	-	1.55C	830	0.50			1,560	3.95		
	$\vdash$	NB NB	4			0.53	38.2				-	_
bel de all access	GP	OWNERS AND ADDRESS OF THE PERSON NAMED IN	harian	7,400	7,240	1		E	6.030	3.81	26.9	D
7th St Off Remp to I-605 SB On Remp	<u> </u>	5B	4	7,400	6,120	0.87	27.2	D	6,800	0.85	32.5	0
r-ous se on Namp	HOV	NB	1	1,650	1,380	Ç.84	-		1,440	0.87		_
		\$8	1	1,650	830	0,57		-	1,560	0.95		
				1-605 Maleille			-					
	GP	NR SB	4	7,400	5,997	103	26.8 41.1	0	7,162	1.00	35.7	£
Carson Steet to FIOV Transition		NB 28	1	1,65C	737	0.45	41.2		633	0.38	3ú 1	€
	HOV	SR	1	1,650	1,086	0.63			707	0.56		
		NR.	4	7,400	5,997	0.81	26.3	D	7.162	0.97	35.7	-
	GP	SB	5	9,250	8,056	C 87	27.9	0	7,417	0.80	26.6	<del>-</del>
HOV Transition to Spring Street		NB	1	1,650	737	0.45	-	-	633	0.38		
	HOV	SB	-	-	-	**	-	-		-		-
	GP	NB	4	7,400	5,353	1772	21.9	C	6,453	0.87	27.2	D
Spring Street to	O.C.	S6	4	7,400	7,442	1.01	34.3	D	6,787	0.92	29.2	D
Willow Street/Katella Avenue	HOV	NB I	1	1,650	737	2.45	-	-	633	5.38	-	-
		SB		-			-		***		-	
	GP	N8	5	9,250	6,250	3.68	26,7	c	6,540	0.71	23.7	C
Willow Street/Katella Avenue CD Road	-	58	4	7,400	6,293	0.85	27.5	Ð	5,680	0.79	28.C	٥
On Ramp to #405	HOV	. NB	1 ,	1,650	427	0.26	-		634	9.42	-	-
		58				-	-	**	- 1	-	-	-
Dances Tree   1 1	***	- CD		b Street Mair				_				
Pepper Tree Lane to Studebaker Road	GP	EB WB	2	3,700	3,353	0.51	17.9	D	3,875	1.05	20.7	C.
		E8	3	5,550	3,407	0-61	18.2	E	1,980	0.35	10.5	A
Studebaker Road to I-605	GP.	60	2	8,700	4,598 4,004	1.24	38.3		5,121	1.3B		F

- otes:

  J. Peak hour capacity and traffic volumes are shown in vehicles per hour (pph).

  J. Dentry's ablown in passanger cardinal/pine (pulmin\*).

  J. Sectory's ablown in passanger cardinal/pine (pulmin\*).

  J. Sectory's ablown in passanger cardinal/pine (pulmin\*).

  J. Sectory's ablown (DSC) deniers (propose (PPI) lane LUS) is based on density except when demand-to-capacity (D/C) radio is greater than on equal to 1.0, which is US) is.

  J. Sectory's in the cases of 30 pulmin, therefore LUS is also and the capacity (PPI) company Vehicle (BOV) lane.

  J. Petriky in the cases of 30 pulmin, therefore LUS is also and the capacity (PPI) and the c

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Table 4.2-4: Existing (Year 2009) Ramp Junction Peak Hour Level of Service

Improvement Project Supplemental Traffic Study

## **GL-9 (Continued)**

					ANG	And Book				PM Peak	
					MAIN	LEGA					
		Ramp	Ramp**	Ramp	du	Ramp Junction	unction	Ramp	du	Ramp	Ramp Junction
nterchange	add i dum	Lanes	Capacity	Traffic Valuma <sup>1</sup>	n/c	Density <sup>2</sup>	SOI	Traffic Valume <sup>2</sup>	٧/د	Density	105335
		Ì	405 Ram	-405 Ramp Junctions	50						
	NB Off Durect	7	3,000	808	0.27	13.2	8	624	0.26	110	9
	NB On Loop	г	1,500	754	0.50	47.7	u	292	0.38	43.1	ta.
Blvd Blvd	NB On Direct	71	1,500	323	0.22	263	o	319	0.21	23.0	v
& Willow St	SB Off (Direct + Loop)	2	3,000	1,079	0.36	16.3	8	918	0.31	13.3	æ
	SB On Loop		1,500	287	0.19	40.5	ш	343	0.23	36.9	
	SB On Direct (from Willow St)	-	1,500	393	0.26	21.0	U	292	0.38	19.7	œ
	NB Off Direct	-	1,500	302	0.20	26.5	U	484	0.33	262	J
Belfower Blvd &	NB On (Direct + Loop)	2	3,000	1,162	0 39	14.3		787	0.26	10.4	ш
os Coyotes Diagonal	SB Off (Direct + Loop)	2	3,000	1,358	0.45	15.7	ω.	2,021	0.67	19.5	60
	SB On (Direct + Loop)	1	1,500	804	0.54	33.4	٥.	1,326	0.88	29.6	۵
	NB Off Direct	-1	1,500	222	0.15	21.0	u	248	0.17	20.2	O
	Na On Direct	1	1,500	371	0.25	36.2	u	396	0.20	35.1	ш
Woodruff Ave	SB Off Direct	44	1,500	724	0,48	27.3	U	572	0.38	24.3	U
	SB On Direct	11	1,500	400	0.27	22.5	U	279	0.19	21.6	u
	NB Off Direct	+1	1,500	365	0.24	21.6	0	511	0.34	21.4	u :
Palo Verde Ave	NB Dn Loop	1	1,500	168	0.11	52.4	L	304	0.20	49.3	4.
& Steam St	SB On Direct (from Steam St)	-	1,500	417	0.28	24.8	v	583	0.39	23.1	U
	NB On Direct	7	1,500	288	0.19	53.1	ш	315	0.21	51.0	u.
Studebaker Rd	SB Off Direct	1	1,500	403	0.27	32.4	ο .	175	0.12	29.8	۵
Zeh Se	SB Off Direct		1,500	88	90.0	30.6	۵	128	60.0	30.5	٥

**GL-9 (Continued)** 

Ramp   Ramp   Ramp   Ramp   Ramp   Ramp   Ramp   Moltunes   Ramp   Ramp   Ramp   Ramp   Moltunes   Ramp   Moltunes   Ramp   Moltunes   Moltun		Table 4.2-4: Existing (Year 2009) Ramp Junction Peak Hour Level of Service	ear 20(	9) Rar	np Junct	ion Pe	ak Hour	Level	of Service	, a		
Ramp Type   Ramp   Ramp   Ramp   Ramp   Ramp   Ramp Junction   Ramp   Ramp Junction   Ramp   Ramp Junction   Ramp   Ramp Junctions   Ramp Ju							Exist	ing (Year	2009) Cond)	tions		
Ramp Type   Ramp   Ramp   Ramp   Ramp Function   Ramp Functi						AM					Peak	
Main   Capacity   Traffic   Main	Interchange	Ramp Type	Ramp			du	Ramp	unction	Rar	du	Ramp	unction
NB Off Direct   1   1500   899   0.60   321   0   879   0.59   370     NB Off Direct   1   1500   899   0.60   321   0   879   0.59   370     NB Off Direct   1   1,500   338   0.23   207   C   661   0.45   245     SB Off Direct   2   3,000   3.93   0.40   20.5   C   301   0.20   21.7     SB Off Direct   1   1,500   366   0.24   23.5   C   301   0.20   21.7     SB Off Direct   1   1,500   644   0.43   18.6   6   0.25   21.6     NB Off Direct   1   1,500   1,58   0.79   3.4   A   813   0.54   2.3     NB Off Direct   1   1,500   1,50   1,50   0.40   3.8.3   C   1,379   0.99   3.25     SB Off Direct   1   1,500   1,50   0.40   3.8.3   C   1,50   0.54   2.3     SB Off Direct   1   1,500   1,50   0.40   3.8.3   C   1,50   0.54   3.4     SB Off Direct   1   1,500   1,50   0.40   3.8.3   C   1,50   0.40   3.8.3     SB Off Direct   1   1,500   1,50   0.40   3.8.3   C   1,50   0.40   3.8.3     SB Off Direct   1   1,500   1,50   0.40   3.8.3   C   1,50   0.40   3.4     SB Off Direct   1   1,500   1,50   0.40   3.8.3   C   1,50   0.40   3.4     SB Off Direct   1   1,500   1,50   0.40   3.8.3   C   1,50   0.40   3.4     SB Off Direct   1   1,500   1,50   0.40   3.8.3   C   1,50   0.40     SB Off Direct   1   1,500   1,50   0.40   3.8.3   C   1,50   0.40     SB Off Direct   1   1,500   1,50   0.40   3.8.3   C   1,50   0.40     SB Off Direct   1   1,500   1,50   0.40   3.8.3   C   1,50   0.40   0.41     SB Off Direct   1   1,50   1,50   0.40   3.8.3   C   1,50   0.40   0.41     SB Off Direct   1   1,50   1,50   0.40   0.40   0.40   0.40     SB Off Direct   1   1,50   0.40   0.40   0.40   0.40   0.40     SB Off Direct   1   1,50   0.40   0.40   0.40   0.40   0.40     SB Off Direct   1   1,50   0.40   0.40   0.40   0.40   0.40     SB Off Direct   1   1,50   0.40   0.40   0.40   0.40   0.40     SB Off Direct   1   1,50   0.40   0.40   0.40   0.40   0.40   0.40     SB Off Direct   1   1,50   0.40			Sanes			۸/د	Density <sup>2</sup>		Traffic Volume <sup>3</sup>	n/c	Density <sup>2</sup>	, soi
NB Off Direct         1         1,500         899         0.60         32.1         0         879         0.59         370           NB Off Direct         1         1,500         338         0.23         207         C         681         0.45         245           NB Off Direct         2         3,000         438         0.43         20.7         C         681         0.45         245           SB Off Direct         1         1,500         366         0.49         23.2         C         481         0.50         217           SB Off Direct         1         1,500         366         0.24         23.5         C         369         0.25         217           NB Off Direct         1         1,500         1,183         0.43         3.4         A         8.3         0.26         23           NB Off Direct         1         1,500         1,183         0.79         3.4         A         8.3         0.24         2.3           NB Off Direct         1         1,500         1,025         0.68         210         C         1.39         0.91         2.25           SB Off Direct         1         1,500         1,005         5.05				-605 Ram	p Junction							
Nad Or Loop         1         1,500         838         0.23         207         C         681         0.45         245           NeW On Direct         1         1,500         665         0.40         20.5         C         481         0.42         24.1           SB Off Direct         1         1,500         1565         0.43         16.2         301         0.70         21.7           SB Off Direct         1         1,500         230         0.13         2.2         301         0.20         21.7           SB Off Direct         1         1,500         1,64         0.43         18.6         6         779         0.47         20.5           SB Off Direct         1         1,500         1,885         0.79         1,337         0.49         33.2           NB Off Direct + Loop)         1         1,500         1,885         0.79         3.4         A         8.3         0.89         3.2           SB Off Direct Copy         1         1,500         1,875         0.68         2.10         C         1,339         0.91         2.2           SB Off Direct Copy         1         1,500         5.47         0.36         3.31         E		NB Off Direct	1	1,500	568	0.60	32.1	0	879	650	37.0	-
NB On Direct         1         1,500         605         0.40         20.5         C         481         0.32         24.1           58 Off Longer         2         3,000         1,395         0.47         15.2         8         1,674         0.56         17.3           58 Off Longer         1         1,500         386         0.24         23.2         C         360         0.75         21.7           58 Off Direct         1         1,500         246         0.43         23.5         C         369         0.75         21.5           58 Off Direct         1         1,500         246         0.43         28.5         E         1,337         0.39         35.2           NB Off Direct         1         1,500         1,668         1,11         39.2         E         1,337         0.39         35.2           NB Off Direct         1         1,500         1,668         1,11         39.2         E         1,337         0.39         35.2           SB Off Direct         1         1,500         1,080         38.3         E         1,337         0.39         35.2           SB Off Direct         1         1,500         1,204         0.36		NB On Loop	-	1,500	338	0.23	20.7	U	681	0.45	24.5	U
SB Off Direct         2         3,000         1,395         0,47         16.2         8         1,674         0,56         173           SB On Loop         1         1,500         366         0,20         332         C         301         0,50         217           SB On Direct         1         1,500         240         0,43         23.5         C         360         0,72         21.5           NB On Loop         1         1,500         1,683         1,11         39.2         E         1,337         0,39         35.2           NB On Direct         1         1,500         1,683         1,11         39.2         E         1,337         0,39         35.2           NB On Direct         1         1,500         1,683         1,11         39.2         E         1,337         0,39         35.2           SB Off Loop         1         1,500         1,260         1,268         37.1         C         1,39         0,91         23.5           SB Off Loop         1         1,500         1,260         38.3         E         1,079         0,47         24.3           SB On Direct (Direct + Loop)         1         1,500         399	Carson St	NB On Direct	-	1,500	605	0.40	20.5	0	481	0.32	24.1	U
SB On Loop         1         1,500         356         0.24         23.2         C         361         0.26         21.7           NB On Direct         1         1,500         644         0.15         23.5         C         369         0.55         21.6           NB On Direct         1         1,500         644         0.43         23.5         C         369         0.55         21.5           NB Off Direct         1         1,500         1,685         1,13         39.2         E         1,33         0.47         2.5           NB Off Direct         1         1,500         1,685         1,03         3.4         A         813         0.54         2.3           SB Off Direct         1         1,500         1,025         5.6         210         C         1,35         0.25         3.4         A         8.3         A           SB Off Loop         1         1,500         399         0,40         26.0         C         700         0,47         2.5           SB Off Loop         1         1,500         399         0,40         26.0         C         700         0,47         2.4           EB Off Loop         1         <		SB Off Direct	2	3,000	1,395	0.47	16.2	00	1,674	0.56	17.3	60
SB On Direct         1         1,500         230         0.13         2.1.6         2.0.7         2.0.5         2.1.6         2.0.5         2.1.6         2.0.5         2.1.6         0.1.7         2.0.5         2.1.6         2.0.7         2.0.5         2.1.6         2.0.5 <th< td=""><td></td><td>SB On Loop</td><td>1</td><td>1,500</td><td>356</td><td>0.24</td><td>23.2</td><td>0</td><td>301</td><td>0.20</td><td>21.7</td><td>U</td></th<>		SB On Loop	1	1,500	356	0.24	23.2	0	301	0.20	21.7	U
NB On Loop		SB On Direct	1	1,500	230	0.15	23.5	J	369	0.25	21.6	U
SB Off Direct   No. 0, 1,665   1,11   39.2   E	ring St/Cerritos Ave	NB On Laop	1	1,500	644	0.43	18.6	œ	602	0.47	20.5	U
W8 Off Direct + Loop)         1         1,500         1,185         0.79         3.4         A         813         0.54         2.3           N8 On Direct (Direct + Loop)         1         1,500         1,005         0.68         210         C         1,359         0.91         22.5           SB Off Direct         1         1,500         1,47         0.36         38.3         E         534         0.35         34.2           SB Off Loop         1         1,500         1,504         0.80         38.3         E         1,073         0.47         24.3           SB On Direct (Direct + Loop)         1         1,500         599         0,40         26.0         C         700         0,47         24.3           FB On Locet         1         1,500         599         0,40         26.0         C         700         0,47         24.3           FB On Locet         1         1,500         59         0,40         36.0         E         65         0,04         41.1           WMS Off Loop         1         1,500         583         0,46         47.7         F         1,311         0,09         46.8		SB Off Direct	1	1,500	1,663	111	39.2	В	1,337	0.89	35.2	w
NB On Direct NB On Direct (Direct + Loop) SB Off Direct SB Off Direct (Direct + Loop) This Street Ramp Duritchors SB Off Loop SB Off Direct (Direct + Loop) This Street Ramp Duritchors SB Off Loop SB Off Direct (Direct + Loop) This Street Ramp Duritchors SB Off Loop SB Off Direct (Direct + Loop) This Street Ramp Duritchors SB Off Loop SB Off Direct (Direct + Loop) This Street Ramp Duritchors SB Off Loop SB Off Direct (Direct + Loop) This Street Ramp Duritchors SB Off Loop SB Off Direct (Direct + Loop) This SB Off Direct (Direct + Loop) This SB Off Direct (Direct + Loop) SB Off Direct (Direct + Loop) This SB Off Direct (		NB Off (Direct + Loop)	-	1,500	1,185	62.0	3.4	4	813	0.54	2.3	4
Se Off Direct   1   1,500   547   0,36   37.1   E   534   0,36   34.2     Si Off Loop   1   1,500   1,204   0,80   38.3   E   1,073   0,72   34.9     Si On Direct (Direct + Loop)   1   1,500   1,204   0,80   26.0   C   700   0,47   24.3     Si On Direct (Direct + Loop)   7th Street Ramp Junctions   1,500		N8 On Direct	-1	1,500	1,025	89.0	21.0	v	1,359	0 91	22.5	U
Si Off Loop   1   1,500   1,204   0,80   38.3   E   1,073   0,77   34.9   34.9   38.0   Direct Direct Loop   1   1,500   599   0,40   26.0   C   700   0,47   24.3   24.9   26.0   C   700   0,47   24.3   24.9   26.0   26.0   24.7   24.3   24.9   24.0   24.0   24.7   24.3   24.9   24.0   24.7   24.3   24.9   24.0   24.7   24.3   24.9   24.3   24.0   24.2   24.3	ilow St/Katella Ave	SB Off Direct	-1	1,500	247	0.36	37.1	ш	534	0.36	34.2	0
Si On Direct (Direct + Loop)   1,500   599   0,40   26,0   C   700   0,47   24,3     Thi Street Ramp Junctions   1,500   51   0,500   1,150     EB On Loop   1,1500   1,500   1,500   1,500     WB Off Loop   1,1500   1,500   1,500   1,500     WB Off Loop   1,1500   1,500   1,500     Use of the control of		SB Off Loop	-1	1,500	1,204	0.80	38.3	w	1,073	0.72	34.9	0
210   210		SB On Direct (Direct + Loop)	1	1,500	599	0.40	26.0	v	700	0.47	24.3	U
EB Off Loop 1 1,500 51 0.03 36.0 E 65 0.04 41.1 EB Ch Loop 1 1,500 1,296 0.86 42.5 F 1,311 0.87 47.1 WB Off Loop 1 1,500 68.3 0.46 47.7 F 1,345 0.99 46.8			7th	Street Ra	mp Junctic	Suc						
EB Ch Loop 1 1,500 1,296 0,86 42.5 F 1,311 0,87 47.1 WB Off Loop 1 1,500 68.3 0,46 47.7 F 1,345 0,99 46.8		EB Off Loop	1	1,500	51	60.03	36.0	Е	59	0.04	41.1	-
WB Off Loop 1 1,500 683 0.46 47.7 F 1,345 0.90 46.8	Studebaker Rd	EB On Loop	v-l	1,500	1,296	98.0	42.5	-	1,311	0.87	47.1	u.
		WB Off Loop		1,500	683	0.46	47.7	u.	1,345	06:0	46.8	٥

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	Table 4.2-4: Existing (Year 2009) Ramp Junction Peak Hour Level of Service	ear 200	19) Ram	p Juncti	on Pea	k Hour	revel o	f Servic		Ì	١
						Pyletic	Near Z	Pyletine (Year 2009) Conditions	Suoi		
		_			AM Peak					PM Peak	
		Rama	Barne	Ramp		Ramp Junction	Inction	Ramp	g	Ramp	Ramp Junction
Interchange	Ramp Type	Lanes	Capacity	Traffic Volume <sup>1</sup>	V/C	V/C Density <sup>2</sup> LOS <sup>3,5</sup>	10535	Traffic Volume <sup>2</sup>	۸/د	Density <sup>2</sup> LOS <sup>NS</sup>	LOSPIS
The second secon			- Cranonia	Statement Branch Connectors	Connecto	- 51					
		- Aemee	1 800	848	0.47	_	,	1,096	0.61	1	-
	1-605 SB to 1-405 NB	1	3 600	1 555	0.43	:		1,864	0.52	1	;
	1-605 SB/7th St to 1-405 NB	1	3,600	1.376	0.38		,	1,305	0.36	1	1
1-405/1-605	AUS NO TO POST OF THE POST OF	1	3.600	5.442	1.51	1		4,784	1.33	1	١,
Freeway Interchanges	1-505 SB to 7th St/1-405 55	-	1 800	1,754	0.97	1	,	1,280	0.71	1	'
	1-505 58/1-405 58 to 7th 5t	1 71	3,600	2,531	0.70	,	,	2,253	0.63	,	
	TEL ST. CO. LOCA NO.	-	1.800	707	0.39	1		768	0.43		

Peak hour cape tity and traffic demand forecast volumes are sho
 Density is shown in passenger cars/mile/jane (pc/mi/in).
 Lavel of Service (LOS) is based on density (pc/mi/in); D/C- dema

2. Leve of Service (LOS) is based on density (pc/ml/m); D/C-dan
4. Pask hour capadists of riceway transper include 5, 300 by hor
5. LOS Fas the tabliflow of the neregyddverge area excessor the
6. Poer Highway Capadity Manual, as the impact area of morgs:

**GL-9 (Continued)** 

I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

Table 4.2-5: Existing (Year 2009) Weaving Level-of-Service Freeway and Collector-Distributor Roads

Weaving Segment	AM Pea	k Hour	PM Peal	k Hour
	Density <sup>1</sup>	LOS <sup>2</sup>	Density <sup>1</sup>	LOS
Freeway Mainline				1.00
I-405 Southbound -				
Lakewood Boulevard/Willow Street to Bellflower Boulevard	42.0	E	61.6	F
Bellflower Boulevard to Lakewood Boulevard/Willow Street	48.5	F	34.9	D
I-405 Southbound -			<del></del>	
Bellflower Boulevard to Woodruff Avenue	38.0	E	55.3	F
1-405 Northbound -	52.4			
Woodruff Avenue to Boilflower Boulevard	52.4	F	38.1	Ε
I-405 Northbound -	44.6			
Palo Verde Avenue/Stearns Street to Woodruff Avenue	44.6	F	32.6	D
I-405 Southbound -	29.9			
Palo Verde Avenue/Stearns Street to Studebaker Road	29.9	ь [	35.5	£
I-405 Northbound -	40.6	E	24.0	
Studebaker Road to Palo Verde Avenue/Stearns Street  Collector-Distributor (C-D) Roads	40.0	-	34.3	D
akewood Boulveard/Willow Street Interchange at I-405				
Southbound C-D Road	19.6	В	20.4	
sellflower Boulevard/Los Coyotes Diagonal Interchange at I-405				
Southbound C-D Road	9,0	A	15.0	В

#### Notes:

- 1. Density is shown in passenger cars/mile/lane (pc/mi/ln).
- Level of Service (LOS) is based on density (pc/mi/n). The density LOS thresholds are different for the freeway mainline and collector-distributor roads.

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Table 4.3-1 No Build Alternative (Year 2020) Intersection Level of Service - AM/PM Peak Hours

I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

## **GL-9 (Continued)**

I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

	Loca	noite			202	O No Build Alte	emative Condi	tions
						ak Hour		ak Hour
No.	East/West Street	North/South Street	Movement	Available Storage (ft)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No
			SBL	300	229	Yes	341	No
1	Carson St	I-605 SB Off Ramp	SBT	1,130	122	Yes	163	Yes
		L.	SBR	300	237	Yes	171	Yes
3	Carson St	I-605 NB Off Ramp	NBL	300 (650)	225	Yes	291	Yes
_	Linsonst	roos no on namp	NBR	300(1175)	193	Yes	125	Yes
			NBL	120	245	No	271	No
			SBL	140	78	Yes	76	Yes
4	Carson St	Pioneer Blvd	SBR	140	73	Yes	83	Yes
			EBL	250	271	No	406	No
			WBL	80	17	Yes	18	Yes
5	Spring St/Cerritos Ave	I-605 SB Off Ramp	SBL	220 (1240)	268	Yes	165	Yes
			SBR	900	0	Yes	0	Yes
6	Spring St/Cerritas Ave	I-605 NB On Ramp	WBL	260	246	Yes	174	Yes
			NBL	180	135	Yes	113	Yes
9	Willow St	Lakewood Blvd	SBL	150	47	Yes	87	Yes
			EBL	175	69	Yes	93	Yes
			WBL	150	42	Yes	151	No
			WBL	1,870	97	Yes	175	Yes
11	1-405 NB Off Ramp	Bellflower Blvd	WBL/T/R	1,130	70	Yes	171	Yes
_			WBR	410	63	Yes	155	Yes
			NBL	150	366	No	130	Yes
12	Willow St.	Beliflower Blvd	SBL	120	142	No	96	Yes
			EBL	140	215	No	351	No
_			WBL	210	127	No	267	Na
		i .	NBL	160	22	Yes	39	Yes
13	Los Coyotes Diagonal	Beliflower Blvd	NBR EBL	230	49	Yes	161	Yes
		1	MRF	190	323	No	599	No
15	Los Coyotes Diagonal	I-405 SB Direct Off Ramp	SBL	150 1525 (500)	207	No	255	No
10	Los Coyotes Diagonal	1-405 Sa Direct Off Ramp	SBL SBL	120	144	Yes	259	Yes
16	Willow St	Los Coyotes Diagonal	EBL	140	156 144	No No	233	No
10	WIIIOW St	Cos Coyoces Diagonal	WBL	160	328	No No		Yes
			NBL	140	670	No No	586 287	No
			NBR	60	33	Yes	17	No Yes
			SBL	120	132	No	59	Yes
17	Willow St	Weodruff Ave	SBR	120	151	No	53	Yes
	11		EBL	200	268	No	204	No
			WBL	180	247	No	180	No
			WBL	550	401.	Yes	266	Yes
20	I-405 NB Direct Off Ramp	Palo Verde	WBT/R	1,155	60	Yes	141	Yes
٠.			EBL	335	318	Yes	209	Yes
21	Woodruff Ave	Palo Verde	EBR	335	228	Yes	190	Yes
			NSL	130	174	No	172	No
22		N. S. M	SBL	120	89	Yes	161	No
22	Stearns St	Pallo Verde	EBL	90	205	No	171	No
			WBL	80	38	Yes	118	No
24	LAGE MIT DISSELLED CO. C.	Charles D.	N8L	100	53	Yes	78 (	Yes
24	1-405 NB Direct On Ramp	Studebaker Rd	SBR	70	12	Yes	23	Yes

	Loc	ation			Na Build	Alternati			
			1	A)	vi Peak His	nur nuc	91	A Peak Ho	our
					Avg Delay			Avg Delay	
No.	East/West Street	North/South Street	Traffic Control/Comments	D/C	(sec)	LOS	D/C	(sec)	ĻO:
1	Carson St	I-605 SB Off Ramp	Existing Traffic Signal	0.57	22.3	С	0.68	23.8	С
		I-605 SB Direct On Ramp	Unsignalized On Ramp	0.22			0.33	-	_=
2	Carson St	I-605 SB Loop On Ramp	Unsignalized On Ramp	0.33	-	_	0.33	-	_
		I-605 NB Off Ramp	Existing Traffic Signal	0.59	21.8	С	0.76	20.6	С
		I-605 NB Loop On Ramp	Unsignalized On Ramp	0.31	-	-	0.35		_
3	Carson St	I-605 NB Direct On Ramp	Unsignalized On Ramp	0.52		-	0.49		_=
4	Carson St	Pioneer Blvd	Existing Traffic Signal	0.79	31.1	C	0.84	33.7	C
5	Spring St/Cerritos Ave	I-605 SB Off Ramp	Existing Traffic Signal	0.68	14.2	B	0.65	10.9	В
5	Spring St/Cerritos Ave	I-605 NB On Ramp	Existing Traffic Signal	0.76	10,5	В	0.79	8.2	А
_	I-405 NB Direct Off Ramp		Unsignalized Off Ramp	0.38	-		0.38	-	
ł	I-405 NB Direct On Ramp		Unsignalized On Ramp	0.38			0.23		
ŀ	I-405 NB Loop Off Ramp		Unsignalized Off Ramp	0.23		-	0.22	-	_
7	I-405 NB Loop On Ramp	Lakewood Blvd	Unsignalized On Ramp	0.53			0.41	-	-
-	I-405 SB Loop On Ramp	CONCRETE OF STREET	Unsignalized On Ramp	0.22			0.25	-	-
8	I-405 S8 Direct Off Ramp	Lakewood Blvd	Unsignalized Off Ramp	0.43		_	0.48	-	
9	Willow St	Lakewood Blvd	Existing Traffic Signal	0.75	31.2	ε	0.89	43.₽	D
9	Willow Sc	1-405 SB Loop Off Ramp	Unsignalized Off Ramp	0.35	32.2		0.46	43.0	_
	Willow St	J-405 SB Direct On Ramp	Unsignalized On Ramp	0.33			0.41		-
10		1-405 SB Direct On Kamp		0.51		В	0.53	10.6	E
.	I-405 NB Off Ramp		Existing Traffic Signal		10.8		0.37	u.b	_
	I-405 NB Loop On Ramp		Unsignalized On Ramp	0.53		-		- 1	
11	I-405 NB Direct On Ramp	Bellflower Blvd	Unsignalized On Ramp	0.31			0.19	-	-
12	Willow St	Bellflower Blvd	Existing Traffic Signal	1.01	48.8	D	1.01	54.4	_
		Bellflower Blvd	Existing Traffic Signal	0.65	26.4	С	1.00	42.1	D
13	Los Coyates Diegonal	1-405 SB Direct On Ramp	Unsignalized On Ramp	0.06			0.12		-
14	I-405 SB Loop Off Ramp	Beliflower Blvd	Unsignalized On Ramp	0.12		-	0.32	-	_
		I-405 SB Direct Off Ramp	Existing Traffic Signal	0.52	10.0	В	0.47	16.0	Е
15	Los Coyotes Diagonal	I-405 SB Loop On Ramp	Unsignalized On Ramp	0.16			0.17		
16	Willow St	Los Coyotes Diagona	Existing Traffic Signal	0.78	44.4	D	1.02	35.1	r
17	Willow St	Woodruff Ave	Existing Traffic Signal	1.33	147.9	F	0.87	40.4	
	I-405 NB Direct Off Ramp		Unsignalized Off Ramp	0.39		-	0.19	- 1	
18	I-405 NB Direct On Ramp	Woodruff Ave	Unsignalized On Ramp	0.31		-	0.21		_
	I-405 SB Direct Off Ramp		Unsignalized Off Ramp	0.52		_	0.47		
19	I-405 SB Direct On Ramp	Woodruff Ave	Unsignalized On Ramp	0.41			0.23	-	_
$\neg$	I-405 NB Direct Off Ramp	,	Existing Traffic Signal .	0.78	17.7	В	0.61	11.8	
2Ω	I-405 NB Loop On Ramp	Palo Verde	Unsignalized On Ramp	0.13		-	0.22	-	-
21	Woodruff Ave	Palo Verde	Existing Traffic Signal	0.84	13.6	В	0.66	10.3	E
22.	Stearns St	Palo Verde	Existing Traffic Signal	0.86	18.9	В	0.83	20.5	
23	Stearns St	I-405 SB Direct On Ramp	Unsignalized On Ramp	0.30			0.46	-	
24	I-405 NB Direct On Ramp	Studebaker Rd	Existing Traffic Signal	0.51	2.6	A	0.47	4.7	1
25	I-405 SB Direct Off Ramp	Studebaker Rd	Unsignalized Intersection	0.66	68.4	F	0.34	16.2	
26	Atherton St	Studebaker Rd	Existing Traffic Signal	0.54	9.3	A	0.78	13.8	-
27	SR-22 WB On/Off Ramp	Studebaker Rd	Existing Traffic Signal	0.46	12.8	В	0.79	28,0	
28	SR-22 EB On/Off Ramp	Studebaker Rd	Existing Traffic Signal	0.91	21.3	С	0.93	25.8	
29	SR-22 WB On/Off Ramp	College Park Dr	Unsignalized Intersection	0.43	21.3	c	0.61	88.7	
30	7th St	Padfic Coast Highway	Existing Traffic Signal	0.94	49.2	D	0.95	35.9	
31	7th St	Beliflower Blvd	Existing Traffic Signal	2.04	68.9	E	0.98	47.9	
32	Pacific Coast Highway	Beltflower Blvd	Existing Traffic Signal	D.53	38.8	D	0.70	20.4	T
33	7th St	Channel Or	Existing Traffic Signal	0.71	24.5	c	0.94	22,7	T
34	7th St	W. Campus Dr	Existing Traffic Signal	0.79	31.2	c	0.81	32.0	

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I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

	Loca	tion		1	202	O No Build Alte	rnetive Condi	tions
				}	AM Pe	ak Hour	PM Pe	ak Hour
No.	East/West Street	North/South Street	Movement	Available Storage (ft)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No
			NBL	200	42	Yes	50	Yes
			SBL	260	1	Yes	2	Yes
26	Atherton St	Studebaker Rd	SBR	70	20	Yes	-6	Yes
			EBL	120	77	Yes	222	No
			WBL	220	29	Yes	24	Yes
	em an um o lod o	Studebaker Rd	NBR	150	1.4	Yes	20	Yes
27	SR-22 WB On/Off Ramp	Studebaker Rd	SBL	200	68	Yes	169	Yes
			NBR	300	1069	No	970	No
28	SR-22 EB On/Off Ramp	Studebaker Rd	SBL	150	331	No	31.8	No
			WBR	60	44	Yes	119	No
20	7th St	Actific Association	NBL	330	172	Yes	292	Yes
30	/tn at	Pacific Coast Highway	SBL	290	253	Yes	338	No
			NBR	130	120	Yes	47	Yes
			SBL	160	195	No	243	No
31	7th St	Bellflower Blvd	SBR	160	80	Yes	277	No
			EBL	200	419	No	400	No
	_		WBL	200	39	Yes	71	Yes
-			NBL.	280	92	Yes	73	Yes
i			SBL	240	258	No	212	Yes
32	Production and Michigan	Beilflower Blvd	SBR	60	17	Yes	36	Yes
32	Pacific Coast Highway	Beilflower Blvd	EBL	110	53	Yes	100	Yes
- 1			WBL	120	56	Yes	64	Yes
			WBR	200	64	Yes	41	Yes
			EBL	270	109	Yes	28	Yes
33	7th St	Channel Dr	EBR	180	23	Yes	6	Yes
-			WBL	280	107	Yes	264	Yes
34	7th St	W. Commun Dr	SBL/R	150	67	Yes	213	No
34	/t/1 5t	W. Campus Dr	EBL	400	88	Yes	3	Yes
			SBL	150	76	Yes	183	No
7.	745.50	5 Canana Da	SBT/R	150	68	Yes	108	Yes
35	7th St	E. Campus Dr	EBL	150	207	No	99	Yes
			WBI.	300	74	Yes	131	Yes

## **GL-9 (Continued)**

I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

_							-		
	Loc	ation						2040) LOS	
No.	East/West Street	North/South Street	Traffic Control/Comments	D/C	A Peak He Avg Delay (sec)	LOS	D/C	A Peak Ho Avg Delay (sec)	LOS
1	Carson St	1-605 SB Off Ramp	Existing Traffic Signal	0.62	22.4	C	0.73	24.5	C
_	COLUMNIA	1-605 SB Direct On Ramp	Unsignalized On Ramp	0.24		-	0.36	24.3	_
2	Carson St	1-605 SB Loop On Ramp	Unsignalized On Ramp	0.35			0.36		
-	441741141	I-605 NB Off Ramp	Existing Traffic Signal	0.63	23.6	c	0.82	23.2	c
		I-605 NB Loop On Ramp	Unsignalized On Ramp	0.33			0.37		1
3	Carson St	I-605 NB Direct On Ramp	Unsignalized On Ramp	0.56			0.53	-	-
4	Carson St	Pioneer Blvd	Existing Traffic Signal	0.86	35.1	D	0.92	43.9	D
5	Spring St/Cerritos Ave	1-605 S8 Off Ramp	Existing Traffic Signal	0.74	15.4	8	0.71	12.0	В
6	Spring St/Ce:ritos Ave	I-605 NB On Ramp	Existing Traffic Signal	0.82	11.6	В	0.86	9.8	A
	I-405 NB Direct Off Ramp		Unsignalized Off Ramp	0.41	-		0.41		-
	I-405 NB Direct On Ramp		Unsignalized On Ramp	0.41			0.25		
	I-405 NB Loop Off Ramp		Unsignalized Off Ramp	0.25			0.23		-
7	I-405 NB Loop On Ramp	Lakewood Blvd	Unsignalized On Ramp	0.57			0.44		-
•	I-405 SB Loop On Ramp	CONEWOOD BIVE	Unsknalized On Ramp	0.24			0.27	-	-
8	I-405 SB Direct Off Ramp	Lakewood Blvd	Unsignalized Off Ramp	0.46			0.52		
9	Willow St	Lakewood Slvd	Existing Traffic Signal	0.81	33.6	C	0.93	48.4	D
3	WIIIDW St	I-405 SB Loop Off Ramp	Unsignalized Off Ramp	0.37	33.0		0.50	90.4	-
10	Willow St	I-405 SB Direct On Ramp	Unsignalized On Ramp	0.37			0.30		_
IU	1 405 NB Off Ramp	1403 SB Direct On Ramp	Existing Traffic Signal	0.55			0.58	11.3	В
				0.52	11.6	В	0.38		
	1-405 NB Loop On Ramp	Bellflower Blvd	Unsignalized On Ramp	0.07		-			-
11	I-405 NB Direct On Ramp		Unsignalized On Ramp	0.33		-	0.20		
12	Willow St	Beliflower Blvd	Existing Traffic Signal	1.09	67.3	E	1.09	70.6	Ε
	l	Beliflower Blvd	Existing Traffic Signal	0.70	26.9	С	1.13	5G.8	E
13	Los Coyotes Diagonal	1-105 SB Direct On Ramp	Unsignalized On Ramp	0.07		-	0.13		
14	1-405 SB Loop Off Ramp	Beliflower Blvd	Unsignalized On Ramp	0.13		_	0.34		
	l	I-405 SB Direct Off Ramp	Existing Traffic Signal	0.55	10.6	В	0.51	16.8	В
15	Los Coyotes Diagonal	1-405 SB Loop On Ramp	Unsignalized On Ramp	0.18		_	0.18		
15	Willow St	Los Coyotes Diagonal	Existing Traffic Signal	0.87	48.8	D	1.18	45.4	D
17	Willow St	Woodruff Ave	Existing Traffic Signal	1.44	180.5	F	0.94	51.5	D
	I-405 NB Direct Off Ramp		Unsignalized Off Ramp	0.42		-	0.20		
18	I-405 NB Direct On Ramp	Woodruff Ave	Unsignalized On Ramp	0.34		_	0.23		
	I-405 SB Direct Off Ramp		Unsignalized Off Ramp	0.56			0.51		
19	I-405 SB Direct On Ramp	Woodruff Ave	Unsignalized On Ramp	0.45			0.25	_	
	I-405 NB Direct Off Ramp		Existing Traffic Signal	0.95	21.2	c	0.70	12.6	В
20	I-405 NB Loop On Ramp	Palo Verde	Unsignalized On Ramp	0.14			0.23		
21	Woodruff Ave	Palo Verde	Existing Traffic Signal	D.91	15.9	В	0.72	11.3	В
22	Stearns St	Palo Verde	Existing Traffic Signal	0.94	22.0	_ c	0.92	24.4	С
23	Stearns St	I-405 SB Direct On Ramp	Unsignalized On Ramp	0.33			0.50	-	
24	1-405 NB Direct On Ramp	Studebaker Rd	Existing Traffic Signal	0.55	2.8	A	0.51	4.9	A
25	1-405 SB Direct Off Ramp	Studebaker Rd	Unsignalized Intersection	1.02	98.3	F	0.33	15.7	C
26	Atherton St	Studebaker Rd	Existing Traffic Signal	0.60	10.7	В	0.85	15.7	В
27	SR-22 WB On/Off Ramp	Studebaker Rd	Existing Traffic Signal	0.50	13.1	В	0.86	30.4	С
28	SR-22 EB On/Off Ramp	Studebaker Rd	Existing Traffic Signal	0.99	30.4	С	1.03	37.1	D
29	SR-22 WB On/Off Ramp	Coflege Park Dr	Unsignalized Intersection	0.51	25.3	D	0.84	152.1	F
30	7th St	Pacific Coast Highway	Existing Traffic Signal	1.02	65.8	E	1.03	58.7	E
31	7th St	Beliflower Blvd	Existing Traffic Signal	1.13	82.4	F	1.06	63.0	£
32	Pacific Coast Highway	Belificwer Blvd	Existing Traffic Signal	0.57	39.1	D	0.82	32.1	С
33	7th St	Channel Dr	Existing Traffic Signal	0.77	25.7	С	1.02	50.8	D
34	7th St	W. Campus Dr	Existing Traffic Signal	0.85	53.1	D	0.87	58.5	E
35	7th St	E. Campus Dr	Existing Traffic Signal	1.12	55.8	E	0.96	16.7	В

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I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

	Loc	ation	T	T -	T 304	O No Build Alte	reaction Canal	
						ak Hour		ak Hour
No.	East/West Street	North/South Street	Movement	Available Storage (ft)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No
			SBL	300	252	Yes	379	No
1	Carson St	I-605 SB Off Ramp	SBT	1,130	134	Yes	178	Yes
			SBR	300	263	Yes	187	Yes
3	Carson St.	I-605 NB Off Ramp	NBL	300 (650)	246	Yes	319	Yes
3	Carson sc	1-005 NB OIT Kamp	NBR	300(1175)	214	Yes	135	Yes
			NBL	1.20	270	No .	299	No
			5BL	140	84	Yes	82	Yes
4	Carson St	Pioneer Blvd	SBR	140	76	Yes	86	Yes
	1	1 1	EBL	250	303	No	431	No
			WBL	80	17	Yes	18	Yes
5	Contractor Contractor Contractor	. coc en ette	SBL	220 (1240)	283	Ves	1.75	Yes
3	Spring St/Cerritos Ave	I-805 SB Off Ramp	SBR	900	D	Yes	D	Yes
6	Spring St/Cerritos Ave	I-605 NB On Ramp	WBL	260	287	No I	191	Yes
			NBL	180	150	Yes	155	Yes
		1	SBL	150	52	Yes	101	Yes
9	Willow St	Lakewood Blvd	EBL	175	76	Yes	100	Yes
			WBL	150	45	Yes	163	No
			WBI.	1,870	106	Yes	185	Yes
11	I-405 NB Off Ramp	Bellflower Blvd	WBL/T/R	1,130	83	Yes	193	Yes
			WBR	410	75	Yes	173	Yes
			NBL	150	403	No	129	Yes
			SBL	120	157	No .	98	Yes
12	Willow St	Beltflower Blvd	EBL	140	234	No	368	No
			W8L	110	139	No 3	274	No
			Nar	160	24	Yes	43	Yes
		l	NBR	230	51	Yes	202	Yes
13	Los Coyotes Diagonal	Bellflower Blvd	EBL	190	347	No	599	No
			WBL	150	218	No I	277	No.
15	Los Coyotes Diagonal	I-405 SB Direct Off Ramp	SBL	1525 (500)	154	Yes	275	Yes
	- cor cy joins biogaile	T-YOU SEE CHICAGO (II FARITO )	SBL	120	185	No	273	No
16	Willow St	Los Coyotes Diagonal	EBL	140	155	No	79	Yes
		cos cojotas o ingeniai	WBL	160	358	No	645	No
-			NBL	140	730	No I	318	No No
		1	NBR	60	35	Yes	17	Yes
	3.5		SBL	120	141	No I	63	Yes
17	Willow St	Woodruff Ave	SBR	120	170	No No	62	Yes
			EBL	200	288	No /		
			MBL	180	272	No No	225	No
_			WBL	550	447	Yes	196 300	No
2D	I-405 NB Direct Off Ramp	Palo Verde	WBT/R			100	0.00	Yes
			EBL EBL	1,155 335	74 356	Yes	170	Yes
21	Woodruff Ave .	Palo Verde	EBR	335	274	Na	280	Yes
			NBL	130		Yes	223	Yes
		-	SBL		189 88	No	188	No
22	Stearns St	Palo Verde		120 90		Yes -	155	No
		-	EBL		229	No	191	No
-			NBL NBL	80	40	Yes	134	No
24	I-405 NB Direct On Ramp	Studebaker Rd	SBR	70	53	Yes	77	Yes
					12	Yes	26	Yes

## **GL-9 (Continued)**

I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

-	Loca	tion			204	No Build Alte	rnative Condit	ions
		3011			AM Pe	ak Haur	PM Pea	ak Hour
No.	East/West Street	North/South Street	Movement	Available Storage (ft)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No)
			NBL	200	88	Yes	61	Yes
			SBL	250	1	Yes	2	Yes
26	Atherton St	Studebaker Rd	SBR	70	29	Yes	6	Yes
			EBL	120	84	Yes	248	No
			WBL	220	30	Yes	26	Yes
			NBR	150	14	Yes	22	Yes
27	SR-22 WB On/Off Ramp	Studebaker Rd	SBL	200	74	Yes	186	Yes
_			NBR	300	1244	No	1127	No
28	SR-22 EB On/Off Ramp	Studebaker Rd	SBL	150	359	No	336	No
~~			WBR	60	46	Yes	171	No
			NBL	330	182	Yes '	324	Yes
30	7th St	Pacific Coast Highway	SBL	290	275	Yes	382	No
_			NBR	130	151	No	37	Yes
			SBL	160	228	No	267	No
31	7th St	Beilflower Blvd	SBR	160	85	Yes	323	No
!	, , , , ,		E8L	200	435	No	372	No
			WBL	200	38	Yes	0	Yes
_			NBL.	280	98	Yes	75	Yes
			SBL	240	273	No	201	Yes
			SBR	60	17	Yes	35	Yes
32	Pacific Coast Highway	Bellflower 8fvd	EBL	110	55	Yes	127	No
			WBL	120	62	Yes	72	Yes
			WBR	200	91	Yes	42	Yes
-			EBI.	270	112	Yes	24	Yes
33	7th St	Channel Dr	EBR	180	20	Yes	61	Yes
23	75.101		WBL	280	109	Yes	266	Yes
W			SBL/R	150	73	Yes	232	No
34	7th St	W Campus Dr	EBL	400	90	Yes	29	Yes
			SBL	150	82	Yes	206	No
			S9T/R	150	71	Yes	127	Yes
35	7th St	E. Campus Dr	EBL	150	212	No	101	Yes
			WBL	300	78	Yes	144	Yes

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10010	1.3-5: No	Bulld Alt	emat	ive (Year	2020) M	ainline	Peak Ho	ur Lev	el of Serv	rice		
			٨	feinline			No Build Alt	ernativo	(Year 2025	Condition	ons	
						AM Pr	eak Hour			PM P	nak Hour	
Logation	Lone Type	Direction	Lenes	Capacity <sup>14</sup>	Traffic Demand Volume	D/C	Donsity	LOS*	Treffic Demand Volume	D/C	Density	ш
			Made La	1-405 (	Mainline	O. Janes	and the latest the	Vice mar	1	a north page		-
		NB	5	9,250	9,530	1.03	41.5	E	9.810	1.05	412	F
Temple Avenue to	GP	58	5	9,250	3,720	105	35.3	E .	10 090	109	1 .	-
Lakewood Boulevard/Willow Street	1000000	NB	1	1,850	1,860	1.01	1 1	-	2.190	1.58	- 1	
area	HOV	SB	1	1,850	1,820	0.98	1 - 1		1,960	1.06	-	_
	1000000	NB.	5	9.250			Weavene S	eament -	Refer to We			-
Lakewood Boulevard/Willow	GP 1	SB	5	9,250					Refer to Wa			-
Street to deliflower Boulevard	10000	NB	1	1.850	1.880	1.01	1 - 1	-	2.190	1.18	T - 1	-
	HOW	SB	1	1,850	1,820	0.98	1 - 1	_	1.960	1.06		-
-		NB	5	9,250	2,000	0.04	Wanger	emben*	Refer to We			-
Bellflower Boulevard to	GP	58	5	9,250					Refer to We			
Woodruff Avenue	2000	NB	1	1,850	1,730	0.94	Amazoneg S	egment -			1 4	
Trees on Fire led	HOV	D BP	1 1	1,850	1,910				2,080	1.12		-
		NB NB	5	9,250	1,910	2.03			2,080	1.12	-	-
111011111111111111111111111111111111111	GP	the married to		or leave care an	-			Life of the winds	Refer to Wes			-20
Woodruff Avenue to		58	4	7,100	8,580 ;	1.15	- 1	F	8,790 j	119	1	F
Pala Verde Avenue/Steams Street	HOV	NB	1	1,850	1,730	0.94	-	-	2,080	1.12	**	
		SB	1	1,850	2,060	1.11	-	-	1,990	1.08	-	-
	GP	NB	ş	9,250			Weaverig Se	gmeat -	Refer to Wee	rve Table	100	30
Palo Verde Avenue/Steams Street	0	SB	5	9,250			Wasuzig Se	graent.	Refer to Wes	rue Table		-
to Studebaker Road	HOV	NB	1	1,850	1,730	0.94	-	-	2,080	1.12	- 1	-
	NOV	SB	1	1,850	2,140	1.18	-	-	2,960	1.11	-	_
		NB	4	7,400	8,500	1.15		7	9.560	1.29	_4	
Studebaker Road to	GP -	SB	5	9,250	8,550	6.92	29.7	D	9,090	0.98	185	€
I-605 NB Off Ramp		NB	1	1.850	2,490	1.35	-	-	2,790	1.51	-	-
	HOV	SB	2	1.850	2.140	1.16	-		2,060	Lix		
		NB	1 1	7,400	6,910	0.83	15.9		7,940	1 07	41.0	E
FGCS NB Off Ramp to 7th St Off	GP	SB	4	7,400	7,150	0.97	31.8	0		105	41.7	£
Ramp		NB	1	1,850	2,490	1.35	. 318		7,830		-	
	HOV	SB SB	1		2,490		-	**	2,790	1.51	-	-
				1,850	THE REAL PROPERTY.	1.16	-	++	2,060	1.11	-	-
mt	GP -	NB	4	7,400	6,910	0.93	359	8	7,348	107	41.0	E
7th St Off Ramp to 4-505 SB On		58	4 :	7,400	7,050 1	0.95	32.1	0	7,690	104	62.7	E
Ramp	HOW	NB	1	1,850	2,490	1.35	-		2,790	5.51		-
		SB	1	1,850	2,140	1.16	-	**	2,060	1-11	-	-
				1-605 N		5 m 10				1200		(122)
	GP -	NB	4	7,400	5,900	0.80	25.8	C	7,420	100	37.5	E
Carson Street to Spring Street		SB	4	7,400	7,750	1 05	47.7	1	7,280 .	0.98	35.0	D
	HOV	NB	1	1,350	1,510	0.82	-	100	1,900	1.03	-	-
	-	SB	1	3,890	1,940	1.05	-	-	1,740	0.94	-	-
Spring Street to	GP -	NB SB	4	7,400	6,720	0.59	28.8	C .	6,330	0.86	16.6	B
Willow Street/Katella Avenue	-	NB NB	1 1	1,850	1,870	1.01	28.6	0	2,450	0.79	247	C
	HOV -	SB	1 1	1,850	2,140	1.16	-		1,840	0.99	-	=
	- 1	NB NB	5	9,250	5,120	0.66	170	В 1	5,740	0.99	20.8	c
Willow Street/Katelle Avenue CD	GP -	58	4 :	7,400	5,660	0.76	243	c	5,140	0.64	24.5	c
Road On Remp to I-405	11011	NB	1	1,850	1,690	0.91	-	-	2,220	1.20	24.3	-
	HOV	58	1	1,850	1,660	0.90	-		1,470	0.79	-	-
				7th Street			CONTRACTOR OF THE PARTY OF THE	-	4,110			1000
		On the distance of	-			-		*Autobach		-		-
Pepper Tree Lane to	co	EE	2 1	3,700	5,270	O.BA	175 1	8	3.160	0.85	16.9	- 8
Pepper Tree Lane to Studebaker Road	GP -	WB .	3 ;	5,550	8,590	0.88	175	6	2,870	0.52	16.9	8
	GP -		-			arress.						

- other:

  1. Neak hour capacity and staffe volumes are shown in webicles per hour (wph).

  2. Denoting is chose in passenger cast/mile/faine (pc/ml/ln).

  3. Denoting is chose in passenger cast/mile/faine (pc/ml/ln).

  3. Level of Service (DS). General Numeric (DF) lane LOSs is based on density except when demand-d-o-capacity (D/C) ratio is greater than or equal to 1.0, which is LOS F.

  4. Peach hour capacities for freeway kenesinched #1,950 yph for each GP lane and a drigfe High Occupancy Vehicle (HGV) lane.

  5. \*\*Dentity if a mosque of 50 pc/ml/c hardered LOS is a

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## **GL-9 (Continued)**

						No Build Al	ternative	No Build Alternative (Year 2020) Conditions	Condition	se	
					AM	AM Peak			M	PM Peak	
		Ramp	Ramp <sup>1,4</sup>	Ramp	du	Ramp J	Ramp Junction	Rar	Ramp	Ramp J	Ramp Junction
Interchange	Ramp Iype	Lanes		Traffic Volume <sup>1</sup>	0/0	Density	10532	Traffic Volume <sup>3</sup>	D/C	Density	FOS <sub>45</sub>
		I	OS Ramp	1-405 Ramp Junctions							
	NB Off Direct	2	3,000	870	0.29	12.6	æ	980	0.29	14.1	80
	NB On Loop	1	1,500	790	0.53	44.8	ш	610	0.41	489	ш.
Lakewood Blvd	NB On Direct	1	1,500	570	0.38	24.8	v	350	0.23	26.3	U
& Willow St	SB Off (Direct + Loop)	2	3,000	1,160	0.39	17.9	8	1,400	0.47	20.4	-
	SB On Loop	н	1,500	310	0.21	45.6	u.	370	0.25	43.1	u
	SB On Direct (from Willow St)	-	1,500	420	0.28	22.0	U	610	0.41	22.4	U
	NB Off Direct.	1	1,500	540	98'0	26.5	U	260	0.37	30.5	٥
Bellflower Blvd &	NB On (Direct + Loop)	2	3,000	1,260	0.42	34.0	u.	840	0.28	12.6	4
Los Coyotes Diagonal	SB Off (Direct + Loop)	2	3,000	1,460	0.49	17.4	m	1,960	0.65	21.8	U
	SB On (Direct + Loop)	-	1,500	9860	0.57	35.0	4	1,400	0.93	33.9	ш.
	NB Off Direct	-1	1,500	280	0.39	22.6	U	280	0.19	24.3	U
	NB On Direct	-	1,500	470	0.31	34.1	4	320	0.21	39.6	L
Woodnuff Ave	SB Off Direct	н	1,500	780	0.52	29.1	٥	620	0.41	29.6	٥
	SB On Direct	н	1,500	620	0.41	22.9	4	300	0.20	24.7	u.
	NB Off Direct	r	1,500	069	0.46	24.0	U	790	0.53	27.8	ш.
Palo Verde Ave	NB On Loop	н	1,500	200	0.13	51.4	ш	330	0.22	26.8	-
& Stearn St	SB On Direct (from Steam St)	п	1,500	450	0.30	26.2	u.	630	0.42	26.3	ш.
	NB On Direct	1	1,500	330	0.22	53.5	u	330	0.22	59.8	<b>ـ</b> ـــا
Studebaker Rd	SB Off Direct	1	1,500	430	0.29	34.9	۵	330	0.22	35.8	ш
746.64	SB Off Direct		1,500	96	0.06	33.3	۵	140	0.09	36.5	ш

Long Beach Area T.

Table 4.3-6: No Build Alternative (Year 2020) Ramp Junction Peak Hour Level of Service

## **GL-9 (Continued)**

	_				the particulation (see 1979) Particulations	2000	Contract of			
				AM	AM Peak			PM	PM Peak	
Ramo Tvoe	Ramp	Ramp <sup>1,4</sup>		Ramp	Ramp	Ramp Junction	Ramp	du	RampJ	Ramp Junction
	Lanes	Capacity	Traffic Volume <sup>1</sup>	D/C	Density <sup>2</sup>	r <sub>s</sub> son	Traffic Volume <sup>2</sup>	2/0	Density <sup>2</sup>	\$1.50n
	2	05 Ramp	1-605 Ramp Junctions							
NB Off Direct	ţ-1	1,500	096	0.64	32.0	۵	940	0.63	38.4	-
NB On Loop	-1	1,500	460	0.31	20.4	Ų	510	0.34	25.0	U
NB On Direct	1	1,500	760	0.52	20.7	0	730	0.49	24.1	U
SB Off Direct	7	3,000	1,210	0.40	13.6	8	1,400	0.47	14.4	-
SB On Loop	e.	1,500	490	0.33	27.7	٥	410	0.27	21.2	J
SB On Direct	-	1,500	250	0.17	22.7	J	330	0.22	21.5	٥
NB On Loop	1	1,500	780	0.52	18.5	8	1,090	0.73	20.4	٥
SB Off Direct	1	1,500	1,030	0.69	34.6	0	1,440	0.96	35.3	ш
NB Off (Direct + Loop)	1	1,500	1,210	0.81	0.2	4	870	0.58	1.1	∢
NB On Direct	+1	1,500	1,120	0.75	19.8	00	1,460	0.97	22.4	U
SB Off Direct	1	1,500	590	0.39	34.2	۵	560	0.37	30.3	10
SB Off Loop	1	1,500	1,120	0.75	34.6	٥	1,030	0.69	30.5	0
SB On Direct (Direct + Loop)	1	1,500	650	0.43	23.6	J	890	0.59	21.5	U
	7th S	treet Ram	7th Street Ramp Junctions	Su						
EB Off Loop	П	1,500	96	90'0	35.2	3	260	0.37	34.1	-
EB On Loop	<del>-</del> -(	1,500	1,210	D.81	40.8	1	1,410	0 94	373	1
WB Off Loop	F1	1,500	740	0.49	40.5	L	1,400	0.93	40.4	L
WB On Loop	-1	1,500	520	0.35	28.1	۵	370	0.25	20.0	

Spring St/Cerritos

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**GL-9 (Continued)** 

Part							No Build Al	ternative (	No Build Alternative (Year 2020) Conditions	Condition	S	
Ramp Type						AM	Peak			PM	Peak	
Traffic   Proper   Lanes Capacity   Traffic   D/C   Density   LOS <sup>1,0</sup>   Volume   D/C   LOS State   Los State			Ramp	RampL*	Ran	du	Ramp Ju	unction	Rac	du	Ramp Junction	unction
Freeway Pranch Connectors   Freeway Pranch Connectors	erchange	add dup	Lanes	Capacity		2/0	Density <sup>2</sup>	<b>√</b> 18901	Traffic Volume <sup>1</sup>	D/C	Density <sup>2</sup> LOS <sup>3,5</sup>	LOS
14605 SB to 1-405 NB		Freev	vav - to	- Freeway	Branch Co	nnectors						
1-605 SB/701-5t to   -405 NB			77	1,800	920	0.51		ı	1,120	0.62	-	
-4.05 SB to 1-605 NB		1-605 SB/7th St to 1-405 NB	7	3,600	1,680	0.47		ı	1,620	0.45	1	:
-605 SB to 7th St/1-405 SB		1-405 SB to 1-605 NB	2	3,600	1,400	0.39		t	1,260	0.35	;	1
H-605 SB/1-405 SB to 7th/5t         1         1,800         2,040         1,13          1,360         0,76           7th St to Le05 NB/L405 NB         2         3,600         1,210         0.34           1,330         0,37           7th St to L405 NB         1         1,800         770         0,43          440         0,24	405/1-605	1-605 SB to 7th St/1-405 SB	2	3,600	4,750	1.32	,	:	4,020	1.12		:
1-405 NB 2 3,600 1,210 0.34 1,330 0.37 1.30 0.43 1.30 0.440 0.24	y interchanges	I-605 SB/I-405 SB to 7th St	н	1,800	2,040	1.13	:	ı	1,360	92.0	1	:
1 1,800 770 0.43 440 0.24		7th St to 1-605 NB/1-405 NB	2	3,600	1,210	0.34	:	:	1,330	0.37	-	'
		7th St to 1-405 NB	1	1,800	770	0.43	:	:	440	0.24		1

Table 4.3-6: No Build Alternative (Year 2020) Ramp Junction Peak Hour Level of Service

1-405 Improvement Project Supplemental Traffic Study

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I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

Table 4.3-7: No Build Alternative (Year 2020) Weaving Level-of-Service Freeway and Collector-Distributor Roads

	AM Pea	k Hour	PM Pea	k Hour
Weaving Segment	Density <sup>1</sup>	LOS <sup>2</sup>	Density <sup>1</sup>	LOS
Freeway Mainline				
I-405 Southbound - Lakewood Boulevard/Willow Street to Bellflower Boulevard	45.2	F	71.1	F
I-405 Northbound - Beliftower Boulevard to Lakewood Boulevard/Willow Street	46.7	F	39.4	Ε
I-405 Southbound - Bellflower Boulevard to Woodruff Avenue	40.3	E	66.9	F
I-405 Northbound - Woodruff Avenue to Bellflower Boulevard	51.5	F	45.2	F
I-405 Northbound - Palo Verde Avenue/Stearns Street to Woodruff Avenue	45.3	F	38.3	E
I-405 Southbound - Palo Verde Avenue/Stearns Street to Studebaker Road	32.6	D	44.2	F
I-405 Northbound - Studebaker Road to Palo Verde Avenue/Steams Street	43.6	F	43.1	F
Collector-Distributor (C-D) Roads		He I		
Lakewood Boulveard/Willow Street Interchange at I-405				
Southbound C-D Road	16.5	В	23.7	С
Bellflower Boulevard/Los Coyotes Diagonal Interchange at I-405			I	
Southbound C-D Road	4.0	A	5.2	A

- 1. Density is shown in passenger cars/mile/lane (pc/mi/ln).
- 2. Level of Service (LOS) is based on density (pc/mi/ln). The density LOS thresholds are different for the freeway mainline and collector-distributor roads.

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## **GL-9 (Continued)**

I-405 Improvement Project Supplemental Traffic Study

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			M	taintine		N	o Build Ale	emative	(Year 2040)	Conditio	ins	
	Lane	-	-			AM Pe	ak Hour			PM Pe	ak Hour	
Location	Туре	Direction	Lanes	Capacity <sup>1,</sup>	Traffic Demand Volume <sup>1</sup>	D/C	Density <sup>7</sup>	LOS'	Traffic Demand Volume <sup>3</sup>	D/C	Density'	LO
		-		1-495 Ma	uniose				11111111	100		_
		NB	5	9,250	10,300	1.11		F	10,610	1.15	1	F
Temple Avenue to	GP	28	5	9,250	10,500	1.14	43.5	£	10,910	1.18	-	7
Lakewood Boulevard/Willow Street	HOV	NB	1	1,850	2,010	1.09	- 1	-	2,370	1.28	-	
	HOV	S8	1	1,850	1,970	1.06	1 - 1	-	2,120	1.15	-	
	GP	NB	5	9,150					Refer to Wa			
Lakewood Boulevard/Willow Street to	Gh.	\$9	5	9,250			Wenving S	egment-	Reter to We	avs Table		
Bellflower Boulevard	HOV	NB	1	1,850	2,010	1.09	- 1	-	2,370	1.28		
	HOV	SB	1	1,850	1,970	1.05		-	2,120	1.15		-
		NB	.5	9,250		J.	Weaving S	aument-	Refer to We	ve Table		
Beliflower Boulevard to	GP	SB	5	3,250		90. 195 015	Weaving S	- Transpa	Refs' to We	ave Table		
Woodruff Avenue		NB	1	1,850	1,873	1.31	-	-	2,250	1.22	-	Γ.
	HOV	SB		1,850	2,063	5.11		14	2,240	1.21	-	-
		MB	.5	9,250			Weaving 5	egment+	Refer to Wes	ave Tuble		
Woodruff Avenue to	GP	58	4	7,400	9,220	1.25	-	F	9.500	1.28		
Palo Verde Avenue/Steams Street		MB.	1	1,850	1,870	1.01		-	2,250	1.22	-	
, , , , , , , , , , , , , , , , , , , ,	HOV	SB	1	1,853	2,250	1.21		_	2,150	3.15		
		N3	5	9,250			Weaving 5	egrrent -	Refer to We	eve Table		
Palo Verde Avenue/Stearns Street to	GP	58	5	9,250					Refer to We			_
Studebaker Road		NB	1	1,850	1.873	1.01	T - !		2,250	1.22	_	
	HOV	SB	1	1.850	2.310	1.25	- 1	-	2,230	1.21	-	
		NB	4	7,400	0.200	1.26		F	10,330	1.40		
Studebaker Road to	GP	42	5	9.250	9.240	1.00	33.7	2	9.330	1.06	44.1	-
1-60S NB Off Ramp		NB	1	1,850	2,730	1.46	-		3.020	1.63	- 1	
	HOV	SB	1	1,850	2,310	1.75	-		2,230	1.21	-	_
	$\vdash$	NB	1	7,400	7,470	1.01	40.1	E	8,590	1.16		
	GP	SB	4	7,400	7,730	1.34	36.7	*****	8.460	1.14		
I-605 NB Off Ramp to 7th St Off Ramp		N9	1	1,950	2,793	1.46	1		3,020	1,63	1 - 1	
	HCV	58		1,850	2,310	1.25	-		2.230	1.21		
		NB	4	7,400	7,470	1.01	40.1	Ε	8,590	1.16		
	GP	SB	4	7,400	7,630	1.03	35 B		8 310	1.12	-	-
7th St Cff Ramp to 1-605 SB On Ramp		NB NB	1	1,850	2,700	1.46	- 22.8	-	3,020	1.63	-	-
	HOV	SR	1	1,850	2,750	1.25		-	2,230	1.21	-	-
		7 20	1	1,850 L685 M		1.25		-	4,430	1.21		_
	1	NB	1 4	7,400	6,880	0.86	1 28.8	£	8,020	1.08	i 44.4	
	GP	SB	4	7,400	8,370	1 13	20.0	F	7,870	1.06	40.6	
Carson Street to Spring Street		NB	1	1,850	1,530	9.88			2,050	1.11		_
	HOV	SB	1	1,850	2,100	1.14	-	-	1,890	1.02		
	GP	NB	4	7,400	5,540	0.75	22.7	¢	6,840	5.92	29.6	
Spring Street to	OF	SB	4	7,400	7,260	0.98	1 32.6	D	6,510	0,85	26.5	
Willow Street/Katella Avenue	HOV	NB	1	1,390	1,630	0.89			2,050	1.11		_
		SB	1	1,85C	2,100	1.24		-	1,880	1.02		_
	GP	NB	2	9,250	5,540	0.60	19.3	C	5,200	0.67	1 225	
Willow Street/Xatella Avenue CO Road		SB NB	4	7,100	6,120 2,020	0.83	26.6	9	5,560 2,650	2.43	26.5	
On Ramp to I-405	HOV	SB SB	1	1,850	2,020	1.25			1,990	1.08	+	
	L	7 20	1	7th Street		1,23		-	1 2,393	2.00	<del></del>	_
Pepper Tree Lane to	_	EB	2	8,700	3.540	0.86	1 28.9		3,420	0.92	19.3	-
Studebaker Road	GP	WB	3	5,550	3,990	0.72	21.4		3,100	0.56	166	-
		EB	2	3,700	4,750	1.28		F	4,340	1.17		1
Studebaker Road to I-605	GP	WB	2	8,700	4,220	1.14	48.4	E	4,215	1.14	1 43.1	7

- need.

  J. Peak hour aspecity and staffic valuenes who who whickes per bour (ups).

  Detaily be shown in assumption of minimal sequential submitted.

  Detaily be shown in assumption of minimal submitted.

  So Level of Service (1003) General Purpose (97) January LOS is based on density encapt when demand-quaspecity (D/C) middle greater than or excess to 1.0, which is LOS F.

  A. Peach hour cassactions for threeway large standards 2,000 with for each OP lane and a single right Cocupancy Vehicle (1007) lane.

  S. \*\*Ceracy is a reason of 40 pointin between 100 is a reason of 100 points three free 100 is a reason of 100 points three free 100 is a reason of 100 points three free 100 is a reason of 100 points three free 100 is a reason of 100 points three free 100 is a reason of 100 points three free 100 is a reason of 100 points three free 100 is a reason of 100 points three free 100 is a reason of 100 points three free 100 is a reason of 100 points three free 100 is a reason of 100 points three free 100 is a reason of 100 points three free 100 is a reason of 100 points.

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Table 4.3-9: No Build Alternative (Year 2040) Ramp Junction Peak Hour Level of Service

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D/C

### **GL-9 (Continued)**

660 660 660 660 660 660 660 660 660 660	2	D/C Density <sup>2</sup> LOS <sup>3,5</sup>	16.2	52.6	0.25 284 F	-	0.27 46.4 F	0.44 23.8 F	0.41 33.4 F	0.30 14.5 F	-	27.0		0.45 32.4 · D	-	0.57 30.9 F		0.45 27.5 F		200	38.0
	~ r o r o o r a r o r o r o r r m	1-			Н	-			-		L		-	-	-	-	-	H	-	350 0.	

NB Off Direct
NB Ch Loop
NB Ch Loop
NB Ch Loop
SO Off Direct (Loon)
SB On Direct (Iron Willion
NB Off Direct (Loop)
SB On (Direct + Loop)
SB On (Direct + Loop)
SB On (Direct + Loop)
NB Off Direct
NB On (Direct + Loop)
SB On Direct
SB Off Direct
SB On Direct
SB On Direct
NB Off Direct

Beilflower Blvd & Los Cayotes Diagonal

Lakewood Blvd & Willow St

Orange County Transportation Authority DRAFT

Long Beach Area Traffic Study

Table 4.3-9: No Build Alternative (Year 2040) Ramp Junction Peak Hour Level of Service

**GL-9 (Continued)** 

SOO 40.2 56 SO1 Density<sup>2</sup> 0.07 Ramp<sup>1,4</sup> Capacity Ramp Na Off Direct
Na On Loop
Na On Loop
Sa Off Direct
Sa On Loop
Sa Off Direct
Na On Loop
Sa Off Direct
Na Off Direct
Na Off Direct
Sa Off Direct
Sa Off Direct
Sa Off Loop
EB Off Loop
WB Off Loop
WB On Loop 8 Spring St/Cerritos

NB On Loop SB On Direct (from Stearn St) NB On Direct SB Off Direct SB Off Direct

Studebaker Rd

Palo Verde Ave & Stearn St

rement Project Supplemental Traffic Study

1-405 Improv

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hority

					Ī	No Build A	temathe	No Build Alternative (Year 2040) Conditions	Condition	5	
					AM	AM Peak			PM	PM Peak	
Interchange	Ramo Topa	Ramp	Ramp Ramp <sup>1,4</sup>	Ramp	du	Ramp J	Ramp Junction	Ramp	g.	Ramp Junctio	uncti
		Lanes	Capacity	Traffic Volume <sup>1</sup>	D/C	Density <sup>2</sup> LOS <sup>3,5</sup>	10535	Traffic Volume <sup>1</sup>	D/C	D/C Density <sup>2</sup> LOS	. 9
	Free	way - to	- Freeway	Freeway - to - Freeway Branch Connectors	nnector	, ,					
	1-605 SB to 1-405 NB	1	1,800	066	0.55		:	1,210	0.67	-	Ĺ
	I-605 SB/7th St to I-405 NB	2	3,600	1,820	0.51	:	,	1,750	0.49	ı	L.
	I-405 SB to I-605 NB	2	3,600	1,520	0.42		,	1,360	0.38	1	Ľ.
Executate International	1-605 SB to 7th St/1-405 SB	2	3,600	5,130	1.43	,		4,340	1.21	!	
200	I-605 SB/I-405 SB to 7th St	1	1,800	2,200	1.22	-	1	1,470	0.82	-	
	7th St to I-605 NB/I-405 NB	2	3,600	1,310	0.35	1	1	1,430	0.40	:	
	7th St to 1-405 NB	+	1.800	830	0.46	1	1	480	0.27	ì	Ĺ

Table 4.3-9: No Build Alternative (Year 2040) Ramp Junction Peak Hour Level of Service

**GL-9 (Continued)** 

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Table 4.3-10: No Build Alternative (Year 2040) Weaving Level-of-Service Freeway and Collector-Distributor Roads

Was designed	AM Pea	k Hour	PM Peal	k Hour
Weaving Segment	Density <sup>1</sup>	LOS <sup>2</sup>	Density <sup>1</sup>	LOS
Freeway Mainline		JH V		
I-405 Southbound - Lakewood Boulevard/Willow Street to Beliflower Boulevard	50.1	F	78.5	F
I-405 Northbound - Bellflower Boulevard to Lakewood Boulevard/Willow Street	51.2	F	43.3	F
I-405 Southbound - Bellflower Boulevard to Woodruff Avenue	44.6	F	73.8	F
I-405 Northbound - Woodruff Avenue to Bellflower Boulevard	57.0	F	50.2	F
I-405 Northbound - Palo Verde Avenue/Stearns Street to Woodruff Avenue	49.7	F	42.1	Ε
I-405 Southbound - Palo Verde Avenue/Stearns Street to Studebaker Road	35.7	ε	48.3	F
I-405 Northbound - Studebaker Road to Palo Verde Avenue/Stearns Street	48.0	F	47.7	F
Collector-Distributor (C-D) Roads			37 1	
Lakewood Boulveard/Willow Street Interchange at I-405			-	
Southbound C-D Road	16.5	В	23.7	, C
Beliflower Boulevard/Los Coyotes Diagonal Interchange at I-405				
Southbound C-D Road	4.0	А	5.2	A

- 1. Density is shown in passenger cars/mile/lane (pc/mi/in).
- 2. Level of Service (LOS) is based on density (pc/ml/ln). The density LOS thresholds are different
- for the freeway mainline and collector-distributor roads.

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## **GL-9 (Continued)**

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	Loc	ation			Aiten	native 1	Year 202	o) Los			
			1	A!	M Peak H	our	Pi	M Peak H	our	1	
					Avg			Avg Delay		No.	East/West Stree
No.	East/West Street	North/South Street	Traffic Control/Comments	Đ/C	(sec)	LOS	D/C	(sec)	LOS		
1	Carson St	I-605 SB Off Ramp	Existing Traffic Signal	0.56	18.7	- 8	0.67	20.1	C		ļ
		I-605 SB Direct On Ramp	Unsignalized On Ramp	0.24			0.38			1	Carson St
2	Carson St	I-605 SB Loop On Ramp	Unsignalized On Ramp	0.35		-	0.36		_	1 ^	Carson st
_		I-605 NB Off Ramp	Existing Traffic Signal	0.59	20.3	c	0.76	16.5	В	72	
		I-605 NB Loop On Ramp	Unsignalized On Ramp	0.30			0.35	-		3	Carson St
3	Carson St	1-605 NB Direct On Ramp	Unsignalized On Ramp	0.51		- 14	0.46	-		-	
4	Carson St	Pioneer Blvd	Existing Traffic Signal	0.79	30.7	С	0.87	31.6	c	f	
5	Spring St/Cerritos Ave	I-605 SB Off Ramp	Existing Traffic Signal	0.68	14.0	В	0.64	10.3	В	1 4	Carson St
6	Spring St/Cerritos Ave	I-605 NB On Ramp	Existing Traffic Signal	0.73	9.3	A	0.78	8.1	Α	li i	
	1-405 NB Direct Off Ramp		Unsignalized Off Ramp	0.43	_		0.41	_		li .	
	1-405 NB Direct On Ramp		Unsignalized On Ramp	0.38			0.22				
	I-405 NB Loop Off Ramp		Unsignalized Off Ramp	0.26	·		0.22		***	5	Spring St/Cerritos
7	I-405 NB Loop On Ramp	Lakewood Blvd	Unsignalized On Ramp	0.53	**		0.41		-	6	Spring St/Cerritos
	I-405 SB Loop On Ramp		Unsignalized On Ramp	0.23			0.25			_	apring by octivios
8	1-405 SB Direct Off Ramp	Lakewood Blvd	Unsignalized Off Ramp	0.41			0.46		-		
9	Willow St	Lakewood Blvd	Existing Traffic Signal	0.74	28.9	c	0.96	46.5	D	9	Willow St
		I-405 SB Loop Off Ramp	Unsignalized Off Ramp	0.33			0.45	-	-	1	
10	Willow St	I-405 SB Direct On Ramp	Unsignalized On Ramp	0.28			0.41			-	
	I-405 NB Off Ramp		Existing Traffic Signal	0.51	10.4	В	0.53	10.9	В	11	I-405 NB Off Ram
	I-405 NB Loop On Ramp		Unsignalized On Ramp	0.51			0.37	-	-		
11	I-405 NB Direct On Ramp	Belifiower Blvd	Unsignalized On Ramp	0.29			0.19	_	_		
12	Willow St	Bellflower Blvd	Existing Traffic Signal	1.00	50.1	D	1.00	51.2	0		
		Bellflower Blvd	Existing Traffic Signal	0.64	27.5	С	1.06	44.6	D	12	Willow St
13	Los Coyotes Diagonal	I-405 SB Direct On Ramp	Unsignalized On Ramp	80.0			0.12	_			
14	I-405 58 Loop Off Ramp	Bellflower Blvd	Unsignalized On Ramp	0.12			0.29	-	-		
		I-405 S8 Direct Off Ramp	Existing Traffic Signal	0.52	10.3	В	0.47	14.0	В		
15	Los Coyotes Diagonal	1-405 5B Loop On Ramp	Unsignalized On Ramp	0.25	31.7		1.04	36.7	_ D	13	Los Coyotes Diagor
16	Willow St	Los Coyotes Diagonal	Existing Traffic Signal	1,32	146.2	F	0.88	40.9	- B		
17	Willow St	Waadruff Ave	Existing Traffic Signal	0.39	146.2		0.20	40.9		15	Los Coyotes Diagor
18	I-40S NB Direct Off Ramp	Woodruff Ave	Unsignalized Off Ramp Unsignalized On Ramp	0.31			0.20	<del>-</del>			
18	I-405 NB Direct On Ramp	Woodruff Ave	Unsignalized Off Ramp	0.51			0.45	-		16	Willow St
19	1-405 SB Direct Off Ramp	Woodruff Ave	Unsignalized On Ramp	0.43			0.43	-	_		
19	I-405 SB Direct On Ramp I-405 NB Direct Off Ramp	Woodrull Ave	Existing Traffic Signal	0.78	17.0	В	0.63	12.0	В		
20	I-405 NB Loop On Ramp	Palo Verde	Unsignalized On Ramp	0.15	-		0.20	12.0	-	li	
21	Woodruff Ave	. Palo Verde	Existing Traffic Signal	0.13	12.9	В	0.68	10.2	В	17	Willow St
22	Stearns St	Palo Verde	Existing Traffic Signal	0.86	18.5	В	0.85	21.0	c	1	WIIIOW St
23	Stearns St	1-405 SB Direct On Ramp	Unsignalized On Ramp	0.33	-	-	0.44	-			
24	1-405 NB Direct On Ramp	Studebaker Rd	Existing Traffic Signal	0.51	1.2	A	0.50	3.1	Α		
25	I-405 SB Direct Off Ramp	Studebaker Rd	Unsignalized Intersection	1.03	113.3	F	0.51	24.8	c	20	I-405 NB Direct Off R
26	Atherton St	Studebaker Rd	Existing Traffic Signal	0.54	10.3	В	0.79	14.8	В	20	1 403 NO DITECTOR I
27	SR-22 WB On/Off Ramp	Studebaker Rd	Existing Traffic Signal	0.53	13.0	В	0.76	27.3	С	21	Woodruff Ave
28	SR-22 EB On/Off Ramp	Studebaker Rd	Existing Traffic Signal	0.97	28.9	c	0.96	28,6	c	~	Troodrait Ave
29	SR-22 WB On/Off Ramp	College Park Dr	Unsignalized Intersection	0.51	24.3	c	0.73	104.8	F		
30	7th St	Pacific Coast Highway	Existing Traffic Signal	0.96	53.2	D	0.96	37.4	D	22	Steams St
31	7th St	Bellflower Blvd	Existing Traffic Signal	1.06	71.4	E	0.96	42.8	D	1	J. Steam J. St.
32	Pacific Coast Highway	Beliflower Slvd	Existing Traffic Signal	0.50	36.6	D	0.69	19.5	В	_	
33	7th St	Channel Dr	Existing Traffic Signal	0.74	23.2	c	0.95	25.6	. с	24	1-405 N8 Direct On R
34	7th St	W. Campus Dr	Existing Traffic Signal	0.79	33.2	c	0.82	35.6	D		The same of the
35	7th St	E. Campus Dr	Existing Traffic Signal	1.03	38.0	D	0.88	14.9	В		

	l.oca	ition				2020 Alternativ	e 1 Condition	s
						ak Hour		ak Hour
No.	East/West Street	North/South Street	Movement	Available Storage (ft)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No
			SBL	300	211	Yes	337	No
1	Carson St	I-605 SB Off Ramp	SBT	1,130	121	Yes	178	Yes
			SBR	300	238	Yes	186	Yes
3	Carson St	1-605 NB Off Ramp	NBL	300 (650)	234	Yes	294	Yes
_	CONSOLIDA	1-005 till Oll Kallip	NBR	300(1175)	210	Yes	133	Yes
			NBL	120	232	No	285	No
			SBL	140	77	Yes	76	Yes
4	Carson St	Pioneer Blvd	SBR	140	72	Yes	84	Yes
			EBL	250	273	No	413	No
			WBL	80	17	Yes	16	Yes
5	Spring St/Cerritos Ave	I-605 SB Off Ramp	SBL	220 (1240)	264	Yes	160 .	Yes
	Spring Styceritos ave	r-oup ap Oil Remp	SBR	900	0	Yes	0	Yes
6	Spring St/Cerritos Ave	I-605 NR On Ramp	WBL	260	221	Yes	165	Yes
			NBL,	1.80	130	Yes	130	Yes
g	Willow St	Lakewood Blvd	SBL	150	44	Yes	97	Yes
-	evillow 21	CAKEMOOD GIAG	EBL	175	68	Yes	78	Yes
			WBL	150	39	Yes	126	Yes
			WBL	1,870	103	Yes	175	Yes
11	I-405 NB Off Ramp	Bellflower Bivd	WBL/T/R	1,130	54	Yes	173	Yes
			WBR	410	51	Yes	156	Yes
			NBL	150	357	No	135	Yes
12	Willow St	Bellflower Blvd	SBL	120	135	No	113	Yes
17	WINDW SC	Delitiowet Bive	EBL	140	212	No	342	No
			WBL	110	215	No	239	No
			NBL	160	23	Yes	36	Yes
13	Los Coyotes Diagonal	Bellflower Blvd	NBR	230	49	Yes	163	Yes
10	Los Coyotes Diagonal	Bellilower Bivu	EBL	190	319	No	587	No
			WBL	150	206	No	253	No
15	Los Coyotes Diagonal	1-405 SB Direct Off Ramp	SBL	1525 (500)	140	Yes	257	Yes
			SBL	120	142	No	239	No
16	Willow St	Los Coyotes Diagonal	EBL	140	158	No	72	Yes
	LI		WBL	160	326	No	599	No
			NBL	140	688	No	288	Nο
		[	NBR	60	34	Yes	18	Yes
17	Willow St	Woodruff Ave	SBL	120	129	No	63	Yes
1/	WIIIOW St	WOODDING AVE	SBR	120	138	No	50	Yes
		[	EBL	200	246	No	173	Yes
			WBL	180	260	No	194	No
20	I-405 NB Direct Off Ramp	Paio Verde	WBL	550	383	Yes	259	Yes
20	1 400 NB DIRECTOR Namp	Felo verde	WBT/R	1,155	72	Yes	163	Yes
21	Woodruff Ave	Palo Verde	EBL	335	319	Yes	209	Yes
2.4	TOURIUM AVE	raio verue	EBR	335	194	Yes	180	Yes
			NBL	130	155	No	167	No
22	Steams St	Palo Verde	SBL	120	95	Yes	173	No
	Steams St.	Palu Verue	EBL	90	219	No	178	No
			WBL	80	36	Yes	117	No
24	1-405 N8 Direct On Ramp	Studebaker Rd	NBL	100	1	Yes	58	Yes
2.4	1-05 No offect on Ramp	Studebaker no	SBR	70	8	Yes	18	Yes

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			1	7		2020 Alternativ	a 1 Condition	-
	Lota	tion				ak Hour		ak Hour
Na.	East/West Street	North/South Street	Movement	Available Storage (ft)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No)	95th Percentile Queue (ft)	Adequate Storage? (Yes or Mo
			NBL	200	40	Yes	56	Yes
			SBI,	260	1	Yes	3	Yes
25	Atherton St	Studebaker Rd	SBR	70	61	Yes	21	Yes
			EBL.	120	77	Yes	223	No
			WBL	220	28	Yes	26	Yes
-			NBR	150	15	Yes	21	Yes
27	SR-22 WB On/Off Ramp Studebaker I	Studebaker Rd	SBL	200	64	Yes	176	Yes
			NBR	300	1180	No	1032	No
28	SR-22 EB On/Off Ramp	Studebaker Rd	SBL	150	386	No	257	No
			WBR	60	50	Yes	145	No
			NBL	330	163	Yes	243	Yes
30	7th St	Pacific Coast Highway	SBL	290	275	Yes	364	No
			NBR	130	95	Yes	35	Yes
			SBL	160	166	No	228	No
31	7th St	Beliflower Blvd	SBR	160	82	Yes	250	No
			EBL	200	450	No	365	No
			WBL	200	39	Yes	74	Yes
			NBL	280	96	Yes	73	Yes
			SBL	240	231	Yes	204	Yes
			SBR	60	21	Yes	33	Yes
32	Pacific Coast Highway	Beltflawer Blvd	EBL	110	59	Yes	105	Yes
			WBL	120	49	Yes	59	Yes
			WBR	200	58	Yes	39	Yes
	7th St Channel Dr		EBL	270	107	Yes	29	Yes
33		Channel Dr	EBR	180	22	Yes	6	Yes
			WBE	280	106	Yes	262	Yes
		A	SBL/R	150	68	Yes	216	No
34	7th 5t	W. Campus Dr	EBL	400	91	Yes	28	Yes
			SBL	150	76	Yes	186	No
	71.6	F 6	SBT/R	150	67	Yes	109	Yes
35	7th St	E. Campus Dr	EBL	150	207	No	102	Yes
			WBL	300	76	Yes	135	Yes

## **GL-9 (Continued)**

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Long Beach Area Traffic Study

	Lo	cation		1	Aiten	native 1	(Year 204	20110	_
				A	M Peak He			M Peak He	
No.	East/West Street	North/South Street	Traffic Control/Comments	D/C	Avg Delay (sec)	1.05	D/C	Avg Delay (sec)	J.
1	Carson St	I-605 SB Off Ramp	Existing Traffic Signal	0.61	18.8	В	0.73	20.8	1
		I-605 SB Direct On Ramp	Unsignalized On Ramp	0.26			0.41	20.0	$\vdash$
2	Carson St	I-605 SB Loop On Ramp	Unsignalized On Ramp	0.38		_	0.39	-	
	-	I-605 NB Off Ramp	Existing Traffic Signal	0.63	21.8	Ċ	0.82	18.4	
	i	1-605 NB Loop On Ramp	Unsignalized On Ramp	0.33			0.37	20.4	
3	Carson St	1 505 NB Direct On Ramp	Unsignalized On Ramp	0.55	† l		0.49	-	1
4	Carson St	Pioneer Bivd	Existing Traffic Signal	0.87	34.7	c	0.90	41.4	
5	Spring St/Cerritos Ave	1-605 SB Off Ramp	Existing Traffic Signal	0.73	15.2	8	0.70	11.4	-
6	Spring St/Corritos Ave	I-605 NB On Ramp	Existing Traffic Signal	0.79	10.3	В	0.85	9.5	
	I-405 NB Direct Off Ramp		Unsignalized Off Ramp	0.47	-		0.44		1
	I-405 NB Direct On Ramp		Unsignalized On Ramp	0.41	_		0.24		
	i-405 NB Loop Off Ramp		Unsignalized Off Ramp	0.28			0.24	-	
7	I-405 NB Loop On Ramp	Lakewood Blvd	Unsignalized On Ramp	0.57			0.44	-	<u> </u>
	i-405 SB Loop On Ramp		Unsignalized On Ramp	0.25			0.27	- 1	
8	I-405 SB Direct Off Ramp	Lakewood Blvd	Unsignalized Off Ramp	0.44	1 - 1		0.50		Η.
9	Willow St	Lakewood Blvd	Existing Traffic Signal	0.79	33,1	С	0.93	48.7	
_		I-405 SB Loop Off Ramp	Unsignalized Off Ramo	0.36			0.48		
10	Willow St	i-405 5B Direct On Ramp	Unsignalized On Ramp	0.31			0.44		
$\neg$	I-405 NB Off Ramp		Existing Traffic Signal	0.55	11.3	В	0.58	11.3	
	1-405 NB Loop On Ramp		Unsignalized On Ramp	0.55	-		0.40	-	
11	I-405 NB Direct On Ramp	Beliffawer Blvd	Unsignalized On Ramp	0.32	T., 1		9.20		
12	Willow St	Belfflower Blvd	Existing Traffic Signal	1.09	68.2	E	1.10	68.1	
		Beliflower Blvd	Existing Traffic Signal	0.70	28.1	c	1.15	59.4	
13	Los Coyotes Diagonal	I-405 SB Direct On Ramp	Unsignalized On Ramp	0.08			0.13		
14	I-405 S8 Loop Off Ramp	Belifiower Blvd	Unsignalized On Ramp	0.13			0.32		
Ţ		I-405 SB Direct Off Ramp	Existing Traffic Signal	0.56	10.8	8	0.51	14.7	
15	Los Coyotes Diagonal	I-405 SB Loop On Ramp	Unsignalized On Ramp	0.27	-	_	0.18		-
16	Willow St	Los Coyotes Diagonal	Existing Traffic Signal	0.86	36.4	D	1.20	50.4	-{
17	Willow St	Woodruff Ave	Existing Traffic Signal	1.43	179.2	F	0.94	53.1	-
П	I-405 NB Direct Off Ramp		Unsignatized Off Ramp	0.43		<u> </u>	0.22	-	_
18	I-405 NB Direct On Ramp	Woodruff Ave	Unsignalized On Ramp	0.34			0.23	-	_
-1	1-405 SB Direct Off Ramp		Unsignalized Off Ramp	0.55	7.0		0.49	-	_
19	I-405 SB Direct On Ramp	Woodruff Ave	Unsignalized On Ramp	0.47			0.25	_	-
	I-405 NB Direct Off Ramp		Existing Traffic Signal	0.96	20.6	Ċ	0.73	13.1	E
20	1-405 NB Loop On Ramp	Palo Verde	Unsignalized On Ramp	0.17			0.21		
21	Woodruff Ave	Palo Verde	Existing Traffic Signal	0.91	15.4	В	0.74	11.2	_
22	Stearns St	Palo Verde	Existing Traffic Signal	0.94	21.7	C '	0,93	25.1	_
23	Stearns St	I-405 SB Direct On Ramp	Unsignalized On Ramp	0.35		-	0.48		_
24	I-405 NB Direct On Ramp	Studebaker Rd	Existing Traffic Signal	0.55	1.4	A	0.54	3.2	7
25	I-405 SB Direct Off Ramp	Studebaker Rd	Unsignalized Intersection	1.24	170.6	F	0.53	25.2	- [
6	Atherton St	Studebaker Rd	Existing Traffic Signal	0.58	11.1	В	0.86	16.9	_
27	SR-22 WB On/Off Ramp	Studebaker Rd	Existing Traffic Signal	0.52	13.5	В	0.82	29,1	
28	SR-22 E8 On/Off Ramp	Studebaker Rd	Existing Traffic Signal	1.05	43.5	Đ	1.06	40.4	7
29	SR-22 WB On/Off Ramp	College Park Dr	Unsignalized Intersection	0.61	30.2	D	1.00	184.2	- F
30	7th St	Pacific Coast Highway	Existing Traffic Signal	1.04	71.5	E	1.04	62.4	Ė
31	7th St	Bellflower Blvd	Existing Traffic Signal	1.14	84.9	F	1.04	57.2	_
32	Pacific Coast Highway	Bellflower Blvd	Existing Traffic Signal	0.54	36.9	D	0.81	32.0	
33	7th St	Channel Dr	Existing Traffic Signal	0.80	24.3	c	1.03	55.3	E
14	7th St	W. Campus Dr	Existing Traffic Signal	0.85	55.3	Ε	0.89	64.3	— <u>;</u>
15	7th St	E. Campus Dr	Existing Traffic Signal	1.13	58.6	E	0.97	17.2	-

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	Local	tion				2040 Alternativ	ve 1 Condition	ıs
	LOCA	tion				ak Hour		ak Hour
No.	· East/West Street	North/South Street	Movement	Available Storage (ft)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No
-			SBL	300	231	Yes	374	No
1	Carson St	I-605 SB Off Ramp	SBT	1,130	133	Yes	195	Yes
^	Calability	POOD DO ON HAMP	SER	300	267	Yes	205	Yes
-			NBL	300 (650)	255	Yes	322	Yes
3	Carson St	1-505 NB Off Ramp	NBR	300(11.75)	234	Yes	143	Yes
-			NBL.	120	256	No	313	No
			SBL	140	82	Yes	81	Yes
4	Carson St	Pioneer Blvd	SBR	140	74	Yes	88	Yes
7	Carson St	Fibring Str	ESL	250	307	No	452	No
			WBL	- 80	18	Yes	16	Yes
			SBL	220 (1240)	279	Yes	167	Yes
5	Spring St/Cerntos Ave	I-605 SB-Off Ramp	SBR	900	0	Yes	0	Yes
,		1 444 NR 0 - 5	WBL	260	239	Yes	181	Yes
6	Spring St/Cernitos Ave	I-605 NB On Ramp				Yes	157	Yes
			NBL.	180	52	Yes	103	Yes
9	Willow St	Lakewood Blvd	SBL	150	80	Yes	100	Yes
			EBL	175			152	No
_			WBL	150	45	Yes		
			WBL	1,870	110	Yes	187	Yes
11	1-405 NB Off Ramp	Bellflower 8lvd	WBL/T/R	1,130	65	Yes	196	Yes
			WBR	410	61	Yes	176	Yes
			NBL	150	394	No	135	Yes
12	Willow St	Bellflower Blvd	SBL	120	147	No	115	Yes
12	Willow 2c	Delinower bevu	EBL	140	230	No	377	No
			WBL	110	216	No	247	No
			NBL	160	25	Yes	39	Yes
		n 10 nt 1	NBR	230	51	Yes	203	Yes
13	Los Coyotes Diagonal	Bellflower Blvd	EBL	190	344	No	647	No
			WBL	150	217	No	286	No
15	Los Coyotes Diagonal	I-405 SB Direct Off Ramp	SBL	1525 (500)	153	Yes	274	Yes
200	cos anystes ningenia		SBL	120	173	No	279	No
16	WIlliow St	Los Coyotes Diagonal	EBI.	340	167	No	71.	Yes
	11	200 00 00 00 00 00 00 00 00 00 00 00 00	WBL	160	356	No	660	Na
-,			NBL	140	753	No	318	No
			NBR	60	35	Yes	19	Yes
			SBL	120	137	No	66	Yes
17	Willow St	Woodruff Ave	SBR	120	155	No	58	Yes
			EBL	200	268	No	193	Yes
			WBL	180	289	No	212	No
-			WBL	550	426	Yes	290	Yes
20	I-405 NB Direct Off Ramp	Palo Verde	WBT/R	1,155	90	Yes	225	Yes
			EBL	335	355	No	231	Yes
21	Woodruff Ave	Palo Verde	EBR	335	238	Yes	204	Yes
			NBL NBL	130	169	No	181	No
			SBL	120	94	Yes	162	No
22	Stearns St	Palo Verde	EBL	90	245	No.	199	No.
			WBL	80	39	Yes	132	No
			_			Yes	57	Yes
	I-405 NB Direct On Ramp	Studebaker Rd	NBL	100	11	785	20	Yes

## **GL-9 (Continued)**

I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

	Loca	thon	1			2040 Alternati	te 1 Condition			
			1			ak Hour		ak Hour		
No.	East/West Street	North/South Street	Movement	Avadable Storage (ft)	95th Percentile Queue (ft)	Adequate Storage <sup>7</sup> (Yes or No)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No		
		North Street	NBI,	200	67	Yes	75	Yes		
			SBL	260	2	Yes	3	Yes		
26	Atherton St	Studebaker Rd	SBR	70	85	No	21	Yes		
			EBL	120	81	Yes	248	No.		
			WBI	220	30	Yes	28	Yes		
27	SR-22 WB On/Off Ramp	Studebaker Rd	NBR	150	15	Yes	22	Yes		
.,	SK-22 WG ON/OH Kamp	Studeoaker Rd	SBL	200	77	Yes	199	Yes		
			NBR	300	1362	No	1198	No		
28	SR-22 EB On/Off Ramp	Studebaker Rd	SBL	150	421	No	270	No		
			Wer	50	51	Yes	174	No		
30	7th St	/Off Ramp Studebaker Rd  St Pacific Coast Highway	NBL	330	174	Yes	269	Yes		
30	7th St	Pacific Coast Highway	SBL	290	303	No	411	No		
			NBR	130	127	Yes	29	Yes		
i			SBL	160	188	No	254	No		
31	7th St	Bellflower Blvd	58R	160	87	Yes	310	No		
i			EBL	200	473	No	345	No		
			WBL	200	37	Yes	70	Yes		
			NBI.	280	102	Yes	76	Yes		
			SBL	240	247	No	195	Yes		
32	Pacific Coast Highway	Bellflower Blvd	SBR	60	19	Yes	35	Yes		
12	Pacific Coast Highway	networker blvd	EBL	110	62	Yes	127	No		
- 1	advirond bits	Aschic Coast Highway Blvd	way beintower blyd				-	Yes	35	Yes No Yes
_			WBR	200	60	Yes	40	Yes		
- 1			EBL	270	107	Yes	24	Yes		
33	7th St	Channe! Dr	EBR	180	21	Yes	51	Yes		
_	Charling of		WBL	280	107	Yes	264	Yes		
14	7th St	W. Campus Dr	SBL/R	150	73	Yes	235	No		
	70.71	As cerubra or.	EBL	400	85	Yes	28	Yes		
			SBL	150	82	Yes	207	No		
5	7th St	E. Campus Dr	SBT/R	150	71	Yes	128	Yes		
		er campus ur	EBI.	150	212	No	104	Yes		
			WBL	300	80	Yes	147	Yes		

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1-405 Improvement Project Supplemental Traffic Study

## **GL-9 (Continued)**

	Lana Banch Assa Tonffin

	1	1	3/	lainline			Alternatz	ve 1 (Ye	ar 2020) Con	ditions		
	Lane	1	-		_	AM Po	ak Hour		1	PM Pe	ak flour	
Location	Туре	Direction	Lanes	Capacity <sup>1,4</sup>	Traffic Demand Volume <sup>1</sup>	n/c	Density <sup>2</sup>	ros,	Traffic Demand Volume <sup>c</sup>	D/C	Density	LOS
	Table.	Address of the	1000	1-485 Ma	sinlane		- Language		-	1		
	1000	MB	5	9,250	9,540	1.05	41.6	- 15	10,400	112		F
Temple Avenue to	GP	SB	5	9,250	9,680	1.05	360	F.	10,050	1.09		F
Lakewood Boulevard/Willow Street		NB	1	1,850	2,070	1.12	-	-	1,990	1.07	- 1	-
	HOA	SB	1	1,850	1,993	1.08	1.5	-	2,140	3.16	-	
		NS	5	9,250		110	Weavery S	espnont -	Refer to Wea	ve Table		100
Lakewood Boulevard/Willow Street to	GP	58	5	9.250			Weavily 5	egment -	Refer to Wea	we Table		Ditte-
Bell:Bower Boulevard	-	NB	1	1.850	2.050	1.12	I - I	-	2,050	1.11	T - T	
DODGER OF DOLIGNA	HOV	SB	1	1,850	1,990	1.08	-	_	2.140	1.16	-	-
		NB	5	9,250	4,270	2.00	Wonder	ethoent -	Refer to Wea			
n-100 On- in-med an	GP	SB	5	9,250					Refer to Wes			
Beilflower Boulevard to			-	1,850	2.050	1.11	-	regardens -	2,050	1.11	7	_
Woodruff Avenue	HCV	NB	1		. 41444				-	1.15	-	-
		\$8	1	1,850	1,990	1.08	1	-	2,140		-	
to 10	GP	NB	5	5,250		Y (2)			Refer to Wea		1	-
Woodruff Avenue to	-	SB	4	7,400	8,670	1.17	0	*	8,810	1.19	-1	F
Palo Verde Avenue/Stearns Street	HOV	NB	1	1,850	2,070	1.12	-	-	2,060	1,51	-	-
	HU*	58	1	1,850	2,580	1.18	-	11-01	2,020	1,09		-
and the same of th	GP	NB	5	9.250					Refer to Wes			
Palo Verde Avenue/Steams Street to	6P	SB	5	9,250			Weaving 8	eginent -	Kefer to Wea	ve Yable		
Studeboker Road		NB	1	1,850	2,070	1.12	T - I	44	2,060	1.11	-	-
	HOV	SB	2	1,850	2.240	1.21	- 1		2,020	1.09	-	-
		NB NB	4	7.400	8.81D	119		F	10,380	1.40		r
Studeboker Boad to	GP	SB	5	9,250	8,740	0.94	90.7	D	9,090	0.98	18.5	E
I-GOS NB Off Ramp		NB.	1	1,850	2,410	1.80	-	-	1,990	1.08	-	
HOUS NO OTHERD	HOV		_		2,240	1.21	-	-	2,010	1.05	1 -	- 1
	-	SB	1	1.850		0.98			8,900	1.30	- 5	E
	GP	NB	1	7,400	7,250	and originately	88.4				-	F
I-605 NB Off Ramp to 7th St Off Remp		58		7,400	7,190	1.01	343	D	8,d3G	1.09	-	_
resolution and an income	HOV	NB	1	1,850	2,410	1.50	.**	-	1,990	1,09	-	-
10 000-00-00		.58	1	1,850	2,140	1.15	-	-	2,010	1.09	-	-
	GP	NB	4	7,400	7.250	0.98	38.4	£	8,900	1.20		F
20. C. OH 2	OP.	58	6	7.400	7,380	1.00	23.6	D	7,910	1.07	44.6	E
7th St Off Ramp to I-605 58 On Ramp	Lim.	NB	1	1,850	2,430	1,30	-		1,990	1.08		-
	HOV	98	1	1,850	2,140	1.16	-	-	2,010	1.69	24	-
	1			1-605 Mt	реполне				Service III	101/100	Q1= 100	100
10.00		NB	1	7,400	6,140	0.83	27.0	. 0	7,450	1.01	38.5	E
	GP	SB	4	7,400	7,890	1.07	39.1	2	7,410	1.00	361	E
Carson Street to Spring Street		NB	1	1,850	1,590	38.0	-	-	1,580	1.07	-	-
	HOV	58	1	1,850	1,900	1.03	-	***	1,780	0.96	-	- 1
	61	NB	1	7,400	5,360	072	21.9	c	6,410	0.87	27.0	D
Spring Street to	GP.	58	4	7,400	6,830	0.93	20.8	D	6,010	0.81	24.9	C
Willow Street/Katella Avenue	HOV	NB	1	1,850	1,850	1.00	-	44	2,430	1.31	-	1.00
	HUV	58	1	1,850	2,200	1.19		- 74	1,890	1.02	-	-
	GP	NB	5	9,250	5,320	DS6	17.6	8	5,630	0.72	24-0	C
Willow Street/Katella Avenue CD Road	O.	BZ	4	7,400	5,770	0.78	24.8	С	5,220	0.71	148	Ç
On Rempta I-405	HOV	NB	1	2,850	1,480	0.80	-		1,990	1.08	-	-
	HUV	58	1	1,850	1,400	0.76	-		980	0.58	-	-
	N V	S)	Burge	7th Street		11170						
Pepper Tree Lane to	SP	EB	2	8,703	9,160	0.85	169	B	2,750	0.74	14.7	8
Studebaker Road	er.	WB	8	5,550	3,980	0.72	21.9	C	2,300	0.52	15.5	В
Studebaker Road to I-605	GP	EB	2	3,700	1,410	1.19		F	3,630	0.98	33.8	0
SCHOOL DEVEL WORD TO 1-000	OI,	WB	2	3,700	4,240	1.15	48.9	E	4,030	1.09	38.8	

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## **GL-9 (Continued)**

	Table 4.4-6: Alternative 1 (Year 2020) Ramp Junction Peak Hour Level of Service	(Year 2	020) Ra	unf du	ction P	eak Hou	r Level	of Servi	e		
		-				Alterna	tive 1 (Yes	Alternative 1 (Year 2020) Conditions	oditions		Ш
					AM	AM Peak			M4	PM Peak	
Interchange	Ramp Type	Ramp	Ramp <sup>1,4</sup>		Ramp	Ramp	Ramp Junction	Rai	Ramp	Ramp	Ramp Junction
		Lanes	Capacity	Traffic Volume <sup>1</sup>	D/C	Density <sup>2</sup>	COS <sub>37</sub>	Traffic Volume	D/C	Density <sup>2</sup>	1031
		1	405 Ramp Junctions	Junctions							
	N3 Off Direct	2	3,000	066	0.33	13.8	m	950	0.32	16.0	-
	Nã On Loop	1	1,500	790	0.53	644	ш	610	0.41	52.1	14
Lakewood Blvd	NB On Direct	1	1,500	570	0.38	24.8	J	320	0.21	281	Q
& Willow St	SB Off (Direct + Loop)	2	3,000	1,110	0.37	17.5	8	1,360	0.45	20.0	-
	SB On Loop	-	1,500	310	0.21	42.6	u	380	0.25	43.1	-
	SB On Direct (from Willow St)	1	1,500	430	0.29	22.1	U	610	0.41	22.4	٥
	NB Off Direct	1	1,500	520	0.35	56.9	U	965	0.39	33.1	
Belificwer Bivd &	NB On (Direct + Loop)	2	3,000	1,200	0.40	13.9		830	0.28	13.8	
Los Coyotes Diagonal	SB Off (Direct + Loop)	2	3,000	1,450	0.48	17.4	60	1,960	0.65	21.8	U
	SB On (Direct + Loop)	1	1,500	930	0.62	35.0		1,410	0.94	33.9	4
	NB Off Direct	1	1,500	009	0.40	23.3	O	300	0.20	26.9	U
Woodruff Ave	NB On Direct	1	1,500	470	0.31	34.8		320	0.21	42.5	14
	SB Off Direct	1	1,500	760	0.51	29.3	۵	009	0.40	29.6	0
	SB On Direct	ч	1,500	640	0.43	23.1	ı.	290	0.19	24.7	-
Pain Verde Ave	NB Off Direct	-1	1,500	069	0.46	24.5	J	800	0.53	30.5	14
& Stearn St	NB On Loop	-1	1,500	230	0.15	52.4	ш.	290	0.19	62.1	ı
	SB On Direct (from Stearn St)	1	1,500	490	0.33	26.4	4	290	0.39	25.4	4
Studebaker Rd	NB On Direct	1	1,500	270	0.18	55.1	4	280	0.19	65.5	u.
	SB Off Direct	1	1,500	410	0.27	35.4		310	0.21	35.7	W
7th St	SB Off Direct	1	1,500	08	0.05	34.6	٥	120	0.08	27.2	u

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I-405 IMPROVEMENT PROJECT

Long Beach Area Tr

Table 4.4-6: Alternative 1 (Year 2020) Ramp Junction Peak Hour Level of Service

**GL-9 (Continued)** 

## **GL-9 (Continued)**

						Alterna	tive 1 (Yea	Alternative 1 (Year 2020) Conditions	ditions		
					AM	AM Peak			Md	PM Peak	
Interchance	Dame Tune	Ramp	Ramp <sup>1,4</sup>	Ramp	du	Ramp J	Ramp Junction	Ran	Ramp	Ramp J	Ramp Junction
		Lanes		Traffic Volume <sup>1</sup>	D/C	Density <sup>2</sup>	105**	Traffic Volume <sup>2</sup>	D/C	Density	LOS
			605 Ramp	-605 Ramp Junctions							
	NB Off Direct	-1	1,500	1,010	19'0	33.4	a	096	0.64	38.8	ш
	NB On Loop	-	1,500	450	0.30	21.0	٥	520	0.35	25.2	Ü
	NB On Direct	<b>~</b> 1	1,500	770	0.51	21.1	٥	069	0.46	24.2	U
Carson St	SB Off Direct	2	3,000	1,210	0.40	13.7		1,390	97.0	14.4	æů
	SB On Loop	-	1,500	230	0.35	22.3	v	440	0.29	21.4	٥
	SB On Direct	**	1,500	270	0.18	22.9	u	350	0.23	21.7	Ü
	NB On Loop	-1	1,500	780	0.52	18.9	80	1,090	0.73	20.5	U
Spring St/Cerritos Ave	SB Off Direct	н	1,500	1,020	99'0	35.0	ш	1,410	0.94	35.6	В
	NB Off (Direct + Loop)	1	1,500	1,060	0.71	9.0	<	1,630	1.09	7.1	4
	NB On Direct	4-1	1,500	1,100	0.73	20.3	U	1,400	0.93	22.5	U
Willow St/Katella Ave	SB Off Direct	-1	1,500	260	0.37	34.7	٥	570	0.38	31.1	۵
	SB Off Loop	-	1,500	1,120	0.75	35.3	ш	1,020	0.68	31.1	۵
	SB On Direct (Direct + Loop)	1	1,500	290	0.39	24.2	U	800	0.53	21.9	υ
		7th	Street Ra	7th Street Ramp Junctions	us						
	EB Off Loop	1	1,500	110	20'0	34.1	٥	610	0.41	30.1	۵
	EB On Loop	-	1,500	1,270	0.85	40.0	L	1,420	0.95	33.1	٥
Stude baker Ikd	WB Off Loop	1	1,500	790	0.53	43.8	u	1,440	0.96	41.7	u.
	WB On Loop	1	1,500	550	0.37	30.3	۵	390	0.26	21.0	U

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Orange County Transportation Authority

Long Beach Area Traffic Study

1-405 Improvement Project Supplemental Traffic Study

Table 4.4-6: Alternative 1 (Year 2020) Ramp Junction Peak Hour Level of Service

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I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

Table 4.4-7: Alternative 1 (Year 2020) Weaving Level-of-Service Freeway and Collector-Distributor Roads

	AM Peal	k Hour	PM Peal	Hour
Weaving Segment	Density <sup>1</sup>	LOS <sup>2</sup>	Density <sup>1</sup>	LOS <sup>2</sup>
Freeway Mainline				
I-405 Southbound - Lakewood Boulevard/Willow Street to Bellflower Boulevard	45.3	F	75.7	F
[-405 Northbaund - Beliflower Boulevard to Lakewood Boulevard/Willow Street	47.6	F	42.5	E
I-405 Southbound - Beliffower Boulevard to Woodruff Avenue	41.1	ε	67.0	F
I-405 Northbound - Woodruff Avenue to Bellflower Boulevard	52.6	- F	49.7	F
I-405 Northbound - Palo Verde Avenue/Stearns Street to Woodruff Avenue	46.6	F	41.8	E
I-405 Southbound - Palo Verde Avenue/Stearns Street to Studebaker Road	33.4	D	43.9	F
I-405 Northbound - Studebaker Road to Palo Verde Avenue/Steams Street	44.2	F	45.1	F
Collector-Distributor (C-D) Roads				
Lakewood Boulveard/Willow Street Interchange at I-405				
Southbound C-D Road	18.1	В	22.5	с
Bellflower Boulevard/Los Coyotes Diagonal Interchange at I-40	5			
Southbound C-D Road	5.0	А	5.0	A

#### Notes:

- 1. Density is shown in passenger cars/mile/lane (pc/mi/ln).
- 2. Level of Service (LOS) is based on density (pc/mi/ln). The density LOS thresholds are different for the freeway mainline and collector-distributor roads.

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## **GL-9 (Continued)**

1-405 Improvement Project Supplemental Traffic Study

Lung Beach Area Traffic Study

			_				_	_				
			M	lamine			Alternati	ve 1 (Ye	ar 2040) Cor	nditions		_
Location	Lane					AM P	tak Hour			PM Pe	ak Hour	-
to anon	Туре	Direction	Lanes	Capacity <sup>1,4</sup>	Traffic Demand	o/c	Density <sup>2</sup>	TO2,	Traffic Demand	D/C	Density <sup>2</sup>	и
		_	_	1-405 MJ	Volume'	_			Volume <sup>2</sup>			_
		NB	5	9.250	10,515	1.11	1 -	F		-		
Temple Avenue to	GP	SB	5	9.250	10,460	113	43.5	-	10,850	1 17		
Lakewood Boulevard/Willow Street	HOV	NB	1	1,850	2,240	1.21	-		2,140	1.17	1	
	HOV	SB	1	1,850	2,160	1.17		- In	2,312	1.25	- 1	-
	GP	Na	5	9,250			Weaving S	07/00001	Refer to Wes		-	
Lakewood Boulevard/Willow Street to	GP.	SB	5	9,250					Refer to Wes			10.00
Bellflower Boulevard	NOV	NB	1	1,850	2,220	1.20	-	egricus. L ·	2,210	1.19		-
	HOV	58	1	1,850	2,150	1.17	-	-	2,310	1.25	- 1	_
	GP	NB	5	9,250	4130		Weaving C	nement -	Refer to Wea		-	_
Beliflower Boulevard to	(P)	SB	5	9,250					Refer to Was			
Woodruff Avenue	HOV	NB	1	1,850	7,220	1.23		office sense a	2.21C	1.19	1 - 1	
	HOV	SB	10	1,850	2,150	1.25	1 - 1		2,310	1.25	- 1	_:
		N8	5	9.250			Winnama C	Monant -	Refer to Wes		1	_
Woodruff Avenue to	GP	SB	4 1	7,400	9,376	1.27	in a f	garieri, -	9.530		1 3	-
Palo Verde Avenue/Stearns Street		NB	1	1,853	2.240	1.21	-	-		1.29		
	HOV	5B	1	1,850	2,350	1,27			2,220	1.29		_
		NB	5	9,250	who of	****	Thereine Co			1.18		
Polo Verde Avenue/Steams Street to	GP	58	5	9,250					lefer to Wear			-
Studebaker Road		NB I	1	1,850	2,740				Refer to Wear			
	HOV	58	1	1,650	2,420	1.31		-	2,220	1.25	- 1	_
	-	NB	4	7,460	9,520	1.51		**	2,180	1.18	- "	_:
Studebaker Road to	GP	SR	5					F	11,225	1.52		47.00
I-605 N3 Off Ramp	-	NB NB	1	9,250	9.450	1.02	35.1	E	9,830	1.0€	44.1 i	- (
	HOV	98		1,850	2,610	2,41	-		2,150	1.15	-	_
	-	N8	1	1,850	2,420	1.31	-		2,170	1.17	-	_
	GP	SB		7,406	7,850	1.06	43.9	6	9,520	1 30	-	ŧ
F605 NB Off Romp to 7th St Off Ramp	_	-	4	7,100	8,080	1.69	43.2	E	8,270	112		
	HOV	NB	1	1,65C	2,610	1.41	- 1	-	2,150 :	1.16	-	-
		SB	1	1,850	2,420	1.31	- 1	**	2,170	2,37	1	_
	GP :	NB	4	7,400	7,850	1.06	43.9	2	9,620	1.30		-
7th St Off Ramp to I-605 SB On Ramp		58	1	7,400	7,983	1.08	39.3	6	8,140	1.10	_*	.5
	HOV	NB	1	1,850	2,610	1.41	-	-	2,150	1.16	- 1	-
		58	1	1,850	2,310	1.25	-	~	2.170	1.17	- 1	٠.
	. —			1-605 Mar			-	-				_
	GP .	_NB	4	7.400	6,640 !	3.90	29.9	D	8,100	1.09		F
Carson Street to Spring Street		50	4	7,400	3,530	1,15	~*	1	8,020	1.08	42.4	E
	HOV	NB	: 1	1,850	1,720	0.53		-	2,140	1.16	- 1	_
		SB	1	1,85C	2,050	2.11	- :		1,920	1.04	-	-
Spring Street to	GP -	NB SB	4	7.400	5.79C	0.76	22,8	C	6,930	0.94	30.2	2
Willow Street/Katella Avenue	-	NB NB	1	7,400	2,000	1.00	33.9	0	6,500	88.0	27.5	٥
	HOV	SB .	1 -	1,850	2,570	1.08	-		2,630	1.42	-	_
		NB	5 1	9,25C	5.750	0.62	10.0	-	2,540	1.10	- 1	_
Millow Street/Katelia Avenue CD Road	GP -	58	4	7.400	6.243	0.62	27.2	0	5,650	0.76	26.0	5
On Ramp to I-405		NB	1	1,850	2,000	1.05			2,630	0.76	26.9	D
	HOV	56	1	1,850	1,520	0.82	-	-	1,06G	1.42		_
				th Street M		New 1		-	1,080	9.57	- 1	
epper Tree Lane to	co T	EB	2	3,700	3,260	0.85	150 !	9 1	3,750	0.74	113	
tudebaker Road	GP -	WB	3	5.550	3,980 ]	0.72	21.3	- °	2,900 1	0.52	15.5	B
itudebaker Road to I-605	GP -	EB	2	3,700	4,410	1.19		F		0.98	31.8	0
The second section of the sect	26	WR	2	3,700	4,240	1.15	45.9	6	4,030	1.00	38.8	E

The Montrappedity and traffic volumes are shown in various per nour (uph).

2. Dentity is shown in passager cast/mility and polymilyth.

3. Dentity is shown in passager cast/mility and polymilyth.

3. Level of Shreet (City) Green the Propose (Rig) Jame (10% bissed on dentity water) when demand-to-expanity (U/C) as to be greater than on equal to 1.0, which is LCS.F.

4. Pass Durat Casadition for freeway them is include 1883 but for each Citizen and a single high Cooppany Vahide (HCV) Issue.

5. \*\*Pass This is caused 48 polyforth the expense (List) and for each Citizen and a single high Cooppany Vahide (HCV) Issue.

Orange County Transportation Authority DRAFT

March 2015 R2-GL-126 I-405 IMPROVEMENT PROJECT Study

Long Beach Area Tr

Table 4.4-9: Alternative 1 (Year 2040) Ramp Junction Peak Hour Level of Service

unprovement Project Supplemental Traffic Study

## **GL-9 (Continued)**

						Altema	tive 1 [Yea	Alternative 1 (Year 2040) Conditions	ditions		
					AM	AM Peak			PM	PM Peak	
Informit ages	Power Tune	Ramp	Ramp <sup>1,4</sup>	Ramp	d.	Rampj	Ramp Junction	Ramp	du	RampJi	Ramp Junction
and the same	adds damps	Lanes	Capacity	Traffic Volume <sup>t</sup>	5/0	Density <sup>2</sup>	° SOJ	Traffic Volume <sup>2</sup>	5/0	Density <sup>2</sup>	FOS <sub>372</sub>
		1	05 Ramp	1-405 Ramp Junctions							
	NB Off Direct	2	3,000	1,070	0.36	15.9	a	1,020	0.34	18.3	
	VB On Loop	н	1,500	860	0.57	48.5		099	0.44	561	4
Lakewood Bivd	NB On Direct	н	1,500	610	0.41	26.7	u.	340	0.23	30.4	ı
& Willow St	SB Off (Direct + Loop)	7	3,000	1,200	0.40	19.7	8	1,470	65.0	22.5	L
	SB On Loop	н	1,500	340	0.23	46.0	u	410	0.27	46.4	
	SB On Direct (from Willow St)	-1	1,500	460	0.31	23.6	U	099	0.44	23.8	L
	NB Off Direct		1,500	260	0.37	29.5	٥	089	0,42	36.1	
Belificwer Blvd &	NB On (Direct + Loop)	2	3,000	1,300	0.43	15.9	ıL	006	0.30	15.8	L
Los Coyotes Diagonal	SB Off (Direct + Loop)	2	3,000	1,570	0.52	19.8	60	2,120	0.71	24.6	4
	SB On (Direct + Loop)	-1	1,500	1,010	0.67	37.1	u.	1,520	1.01	35.5	4
	NB Off Direct		1,500	940	0.43	25.9	Ų	330	0 22	29.9	-
	NB On Direct	1	1,500	510	0.34	37.2	u.	340	0 23	45.7	4
Woodput Ave	SB Off Direct	4	1,500	820	0.55	32.1	۵	059	0.43	32.4	٥
	SB On Direct	1	1,500	700	0.47	24.0	4	320	0.21	26.1	-
	NB Off Direct	1	1,500	750	0.50	27.3	U	960	0.57	33.8	_
Paio Verde Ave	NB On Loop	1	1,500	250	0.17	56.9	ш.	320	0.21	67.2	
N 245011 31	SB On Direct (from Steam St)	-	1,500	230	0.35	27.7		640	0.43	27.7	u.
1000	NB On Direct	1	1,500	300	0 20	29.7	ı	310	0.21	70.9	
Studebaker Kd	SB Off Direct	1	1,500	450	0.30	38.1	E	330	0.22	38.4	4
7th St	S8 Off Direct	7	1,500	80	9.05	37.1	ш	130	60.0	40.1	ı

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Orange County Transportation Authority

Long Beach Area Traffic Study

Table 4.4-9: Alternative 1 (Year 2040) Ramp Junction Peak Hour Level of Service

-405 Improvement Project Supplemental Traffic Study

**GL-9 (Continued)** 

1.04 1,540 Ramp Ramp Type NB Off Direct
NB On Loop
NB On Loop
SB Of Direct
SB On Direct
NB On Coop
SB Of Direct
NB Off Corect + L
NB On Direct
SB Off Coop
EB Off Loop WB Off Loop WB On Loop Studebaker Rd Spring 5t/Cerritos Willow St/Katella

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Orange County trai

						Alterna	tive 1 (Yea	Alternative 1 (Year 2040) Conditions	ditions		
					AM	AM Peak			PM	PM Peak	
Internipose	Donney Trees	Ramp	Ramp Ramp <sup>1,4</sup>		Ramp	RampJ	Ramp Junction	Ramp	dι	Ramp J	Ramp Junction
a Superior and a supe	add depart	Lanes	Lanes Capacity	Traffic Volume*		D/C Density? LOS <sup>225</sup>	LOS <sup>32</sup>	Traffic Volume <sup>2</sup>		D/C Dersity <sup>2</sup> LOS <sup>3,5</sup>	ççSO7
	Freek	vev - to	Freeway	Freeway - to - Freeway Branch Connectors	onnector	, ,					
	I-605 SB to I-405 NB	1	1,800	870	0.48	-		1,080	09.0	1	:
	I-505 SB/7th St to I-405 NB	2	3,600	1,570	0.46	-		1,600	0.44	:	;
	I-405 SB to I-605 NB	7	3,600	1,390	0.39		:	1,560	0.43	:	:
1-405/1-605	1-605 SB to 7th St/1-405 SB	2	3,600	5,380	1.49	t	1	4,570	1.27		:
LICEWSY HILDINGS BOX	1-605 SB/1-405 SB to 7th St	1	1,800	2,150	1.19		1	1,120	0.62	. 1	:
	7th St to 1-605 NB/1-405 NB	2	3,600	1,200	0.33	:	-	1,330	0.37	-	
	7th St to I-405 NB	п	1,800	810	0.45		:	470	0.26	-	,

Table 4.4-9: Alternative 1 (Year 2040) Ramp Junction Peak Hour Level of Service

Notes:

1. Peak hour capacity and traffic demand forecast volumes are shown in vehicles p

 Peak hour capacity and traffic demand torecast volumes are shown in 2. Density is shown in passenger cars/mile/lane (pc/mt/in).

Level of Service (LOS) is based on density (pc/mit/n); D/C-demand-to-capacity ratio.

5. LDS F as the total flow of the merge/diverge area exceeds the capacity of the freeway segment; the density is not applic

i. \* Per Highway Capacity Manual, as the in

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## **GL-9 (Continued)**

I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

Table 4.4-10: Alternative 1 (Year 2040) Weaving Level-of-Service Freeway and Collector-Distributor Roads

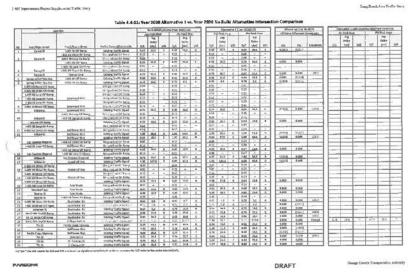
Weaving Segment	AM Pea	k Hour	PM Peal	Hour
Assassing Spikueur	Density <sup>1</sup>	LOS <sup>2</sup>	Density <sup>1</sup>	LOS
Freeway Mainline	, PF 1, 100			
I-405 Southbound -	49.9	F	78.5	-
Lakewood Boulevard/Willow Street to Beliflower Boulevard I-405 Northbound -	49.9	_ F	/8.5	F
Bellflower Boulevard to Lakewood Boulevard/Willow Street	52.3	F	46.6	F
I-405 Southbound -				
Beliflower Boulevard to Woodruff Avenue	45.6	F	73.7	F
I-405 Northbound -	1			
Woodruff Avenue to Beliflower Boulevard	58.3	F	53.2	F
I-405 Northbound	i			
Palo Verde Avenue/Stearns Street to Woodruff Avenue	51.3	F	46.2	F
I-405 Southbound -	36.5	E	48.0	F
Palo Verde Avenue/Stearns Street to Studebaker Road			40.0	-
I-405 Northbound -	48.8	F		
Studebaker Road to Palo Verde Avenue/Steams Street	40.0	٠	55.1	F
Collector-Distributor (C-D) Roads				414
Lakewood Boulveard/Willow Street Interchange at I-405				
Southbound C-D Road	18.1	В	22.5	С
Bellflower Boulevard/Los Coyotes Diagonal Interchange at I-405				_
Southbound C-D Road	5.0	A	5.0	

#### Notes:

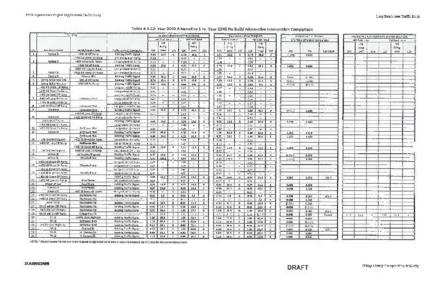
- 1. Density is shown in passenger cars/mile/lane (pc/mi/in).
- 2. Level of Service (LOS) is based on density (pc/mi/ln). The density LOS thresholds are different
- for the freeway mainline and collector-distributor roads.

**PARSONS** 

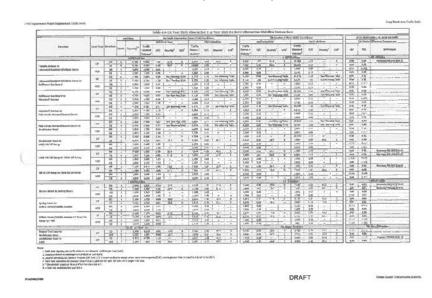
Orange County Transportation Authority
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# GL-9 (Continued)



## **GL-9 (Continued)**



## **GL-9 (Continued)**

						Table 4	4-14: Fee	2540,4	Kernatha	e L es Yes	M 45602 36	in Bivild A	Value tive	Visinkine I	Compenho	n							
				WE'S M				Atlantes	michinia ca			0.00				test Su	Like Caro's	rie.		,	154	O Mirror Will	e i en tital haub to
Legence	Water Trans	Smoon	1	Chica min	-	April	at Key	-		por he	15.154	100	100	ARE THE	m filted		1000	194 Fee	Line		- 4	CARBOR	WHEN CHIPMEN
Control .	man ultra	and and	imi	Cy-ty"	Torbe	28	and.	100	Seasof	100	(new)	100	frested Seesing	44	-	1	To Bi	take:	1000	100	· m	m	Earlysten
			1		teleme"	1500	£ 00000	1	latera "	100	1000	1	Videw'		-	1	VA-ve-		Secreta <sup>1</sup>	148	-	100	Sale dan
	protein the later to			CARPINE								-				1400	Market			- 4	111		AGER
breats Association	**	*	1.	1.6	2.70	111	1	10.3	OPART.	16	123	10.01	10713	100	44		tare	16	Harris S.	200	140		
Liferard Bulmary Willer Steel	West	All	1	Little	3,865	1 146	1		3,64	1.00		1-	1,740	177	-	-	325	144		1	144	70.0	
	-	- 64	100	100	2,415	160	Set when		346	1.00	Tes West	Lin	1.60	1.17	1	-	1376	1.77			4.0	Lie	A LE AN ADDRESS OF
Interest National (William Street ))	97	- 10	-4-	115	20.00	100		n len	1 2000	1.0	and Style		120.00	100	27.00		0.5k	1.24	acise	41.6	10	200	
fellow kelowi	1400	88		- JAK	34(6)	1.29	1		138	1 138		1 -	8380	1 129	A	-	3,69	1,79	-		651	55.04	
	100,000	71	1	LAST	(32)	100	fu su		1,00	1 4.0	Char	Sec.	1.80	111	- No. of the		114	1.34	-		414	478	
Self-Sour Bedfrand v	60	- 63	100	1.K	40.49	2.64	100.00	rales.	130	1.9	Section.	ng tree	2.677	113		565	1 860	10	Manager of	2.0	120	1000	
secret nees	40	A5.	- he	1,868	:20	14	-		3,300	LUE	1.0		2.160	1.00		-	4227	1.39	1 .	W. 34.0	ALI	= /0	
		40	1	915	11-4	1 10	-	476A	100	LR	50.00	14	E/R	F25	Jan 1980	4744	6.45	1.00		or time	10	8.00	
Marks Stewarts	44	ir		Type	Eith.	2.2	51000	100	200	1,00		10.0	129			1000	486	139			100	***	
for contributions/fearts-cost	104	Mt.	13.00	14%	LEV	112			100	1 100	Transport	40.00	6145	100			1,50	1.29		Jan 3	148	Pers.	
		81	1	1/20	10/2	100	in the	a760	200	10	on Place	r. Tibe	139	-	W 1980	-	0.00	118	DE ARTS	or later	180	814	
No on A Amendity on Street at		18	-	1,40	9710	dt.	1000	N. 364	South	1.6	Troubles	ne hin	110	12	NOT HOME	2 10	15.76	1.3	OF REEL		10	1.0	-
scuriorism need	407	43	1 -3-	1 1490	1,976	1 1/2	1		139	1.0	1-2	die	340	18			3,89	1.6	min.	de estre.	436	PM.	land of the land
		RJ.	1	148	124	136		1	PL		-	1	140	- 1			3,000	120		1-	475	100	
Contain Builts	-	- 94	1	130	344	1,00	10	0	33/62	126	411	1	446	18	400		470	100	44.2	1	9:00	200	Teams 19 1015
HER HEIGHT KANN	HOV	64	1	1,665	1305			-	1,790	10	-	-	1493	171	-		142	119	-	-	(6/2)	16.	
	9	214	10.2	120	125	1 94*	491	111	4500	1.104	-	-	007	1.0	-10	-	120	- 55	-	-	495	010	
leads and the to Yard of themp	-	- 14	1	1-0	7210	1.2-	501	-5	1400	114		1	680	-18	451	1	1,00	447	7.54	100	5,01	4.0	
	167	77	1 30	186	1210	14	1.5	1	ANG LIN	1 10	1	100	2400	141	-	-	BLD	146	1		241	-22	
0.00		101	1	1486	1,000	19	100	1.3	8180	114	100	Sec.	100	- 16	-	1	100	179		-	0.04	8.54	
NAME OF PARTY OF PARTY OF PARTY.		19	1	184	180	14	R1	7	#1MF	160		100	7,443	144			118	42	100 P	1.30	1.00	10.8K. 1	
	602	- 13		(84)	100	1.5	-	1	1,090	16		-	100	1.01	- 2	-	1.0	114		-	100	1000	
	100000		000/10	MANNE	4.900		True tea	*	2000	-	1000	1000	- 64-9			1-But w		220000	1	1	10000	-	respect
	47	54	18.5	1.00	1,90	IN	100	100	400	3000	201	20.60	650	10	24	100	14	101	1000	7	4 50	630	District Policies
Department dualities	477.	54	1	MH	1,000	1.56		7	1480	1.0	- 55	1	1799	18.	-	-	160	179	41.4	-	1.00	546	
	-	-1-	-	1,850	166	1.44		1	1640	1.140	111 _ 11	1.5	2.99	7714	17.17	1.1	196	561		-	1000	580 1	recoded a 1 1 1 1 1 1
Spring James I to	100	0			1,300	-	-	-	U.01	- 68	141	100	-1-12		- 02	-	-10-	12	- 21-		1.0	. 66	
Whether (Waldelphone)	80. 1	-35	-	1,800	3,690	9.00	-	1 -	1,690	DR.			1.665	12		-	1,01	14)	-	-	3.00	185	-
	-	- 3	1-1-	169	1,500	1.334	14.7		SAM	144	- 5:00	4.30	334	2.00	Total Control	-	100	126	70	-	- 18	5.00	Second St. Cl. C.
What in North Served has be			1	140	100	0	H	1	1.655		-41-	111	1,000	16	25	17000	144	100	100	8	440	No.	
Europea Land	H05 1	- 1	-	1,84	100	1.04	-	-	1,650	145		+-5-	Tipoe	12		-	1981	14.	-	-	400	0.4	
		1000000		To Street Life	Gla.	1000	No.	mb	100	100000		to the second	Mile	-	-	No. Bear	Lett.	647	-	-	7.41	£ 63	A HATTIN
Asymmetric Long La Statistical Parist	qt .	31	1	2.500	196	12	100	h \$2	Ser.	191	16.0	1.50	1965		26	T.A.	1.76	100	PI	1	.078	ther.	20. WT/MI +01W.T
Contributes Asset to	-	- 12	-	100	1.00			-	1749	100	-6		1,967	2.00	-	-	Nati	-13	- 25		0.00	- 655	-
HK.E	2 1	W.		100	13.6	11.0	100		-13-	110	7	in star	134	2.00	5.5		1.00	18	816	-5-	1.00	712	23000 PL603 TJ

1-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Stud

Long	Beach	Area	Trame	Study

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I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

-	I	ation			Altere	native 1 (	Year 202	0) LOS	
	LDC	a saut		An	A Peak Ho			A Peak Ho	NUT
				- 41	Avg Delay			Avg Delay	-
Na.	East/West Street	North/South Street	Traffic Control/Comments	D/C	(sec)	LOS	D/C	(sec)	LOS
1	Carson St	\$-605 SB Off Ramp	Existing Traffic Signal	0.58	19.1	В	0.67	20.3	С
_	Cursons	I-605 S8 Direct On Ramp	Unsignalized On Ramp	0.24			0.32		_
2	Carson St	I-605 SB Loop On Ramp	Unsignalized On Ramp	0.37		-	0.36	_	-
~	Canjura	1-605 NB Off Ramp	Existing Traffic Signal	0.60	20.1	-	0.75	16.5	В
		I-60S NB Loop On Ramp	Unsignalized On Ramp	0.33			0.36	_	
3	Carson St	I-605 NB Direct On Ramp	Unsignalized On Ramp	0.51			0.46		-
4	Carson St	Ploneer Blvd	Existing Traffic Signal	0.78	34.4	С	0.84	31.2	С
5	Spring St/Cerritos Ave	I-G05 SB Off Ramp	Existing Traffic Signal	0.68	14.5	В	0.57	9.8	A
6	Spring St/Cerritos Ave	I-605 NB On Ramp	Existing Traffic Signal	0,69	7.9	A	0.74	7.7	A
<u> </u>	I-405 NB Direct Off Ramp		Unsignalized Off Ramp	0.42			0.42	-	-
	I-405 NB Direct On Ramp		Unsignalized On Ramp	0.39			0.20		
	1-405 NB Loop Off Ramp		Unsignalized Off Ramp	0.23	**		0.23	-	_
7	1-405 NB Loop On Ramp	Lakewood Blvd	Unsignalized On Ramp	0.54			0.41	-	
÷	I-405 SB Loop On Ramp		Unsignalized On Ramp	0.22			0.25	-	-
8	I-405 SB Direct Off Ramp	Lakewood Blvd	Unsignalized Off Ramp	0.42		-	0.47	_	
9	Willow St	Lakewood Blvd	Existing Traffic Signal	0.75	28.3	C .	0.90	44.3	D
_		I-405 SB Loop Off Ramp	Unsignalized Off Ramp	0.33		-	0.45	-	_
10	Willow St	I-405 SB Direct On Ramp	Unsignalized On Ramp	0.31		-	0.43	-	
	I-405 NB Off Ramp		Existing Traffic Signal	0.52	10.5	В	0.53	11.6	В
	I-405 NB Loop On Ramp		Unsignalized On Ramp	0.51			0.36		**
11	I-405 NB Direct On Ramp	Beliflower Blvd	Unsignalized On Ramp	0.30			0.18		
12	Willow St	Bellflower Blvd	Existing Traffic Signal	0.98	39.0	D	1.15	78.7	E
		Bellflower Blvd	Existing Traffic Signal	0.62	27,4	c	1.03	41.Z	Ð
13	Los Coyotes Diagonal	1-405 SB Direct On Ramp	Unsignalized On Ramp	0.08			0.14	-	
14	I-405 SB Loop Off Ramp	Beliflower Blvd	Unsignalized On Ramp	0.12			0.25	-	
		1-405 SB Direct Off Ramp	Existing Yraffic Signal	0.52	10.4	9	0.48	14.1	В
15	Los Coyotes Diagonal	1-405 SB Loop On Ramp	Unsignalized On Ramp	0.31			0.20		
16	Willow St	Los Coyotes Diagonal	Existing Traffic Signal	0.88	54.7	D	1.25	79.6	
17	Willow St	Woodruff Ave	Existing Traffic Signal	1.41	203,6	F	88.0	54.3	D
	I-405 NB Direct Off Ramp		Unsignalized Off Ramp	0.44			0.23		
18	I-405 NB Direct On Ramp	Woodruff Ave	Unsignalized On Ramp	0.29			0.21	_	
	I-405 SB Direct Off Ramp		Unsignalized Off Ramp	0.51			0.46		
19	I-405 SB Direct On Ramp	Woodnuff Ave	Unsignalized On Ramp	0.44	~_	-	0.26	-	-
	I-405 NB Direct Off Ramp		Existing Traffic Signal	0.69	15.3	В	0.59	11.8	В
20	I-405 NB Loop On Ramp	Palo Verde	Unsignalized On Ramp	0.10	-	-	0.19	-	
21	Woodruff Ave	Palo Verde	Existing Traffic Signal	0.82	13.8	В	0.70	11.3	B
22	Stearns St	Palo Verde	Existing Traffic Signal	0.83	17.9	В	0.83	20.2	С
23	Stearns St	I-405 SB Direct On Ramp	Unsignalized On Ramp	0.29	_	-	0.40		-
24	I-405 NB Direct On Ramp	Studebaker Rd	Existing Traffic Signal	0.54	3.3	A	0.52	2.7	A
25	I-405 SB Direct Off Ramp	Studebaker Rd	Unsignalized Intersection	0.90	61.5	F	0.61	31.4	-
26	Atherton St	Studebaker Rd	Existing Traffic Signal	0.59	8.5	A	0.79	15.0	В
27	SR-22 WB On/Off Ramp	Studebaker Rd	Existing Traffic Signal	0.49	13.0	В	0.83	28.9 30.1	C
28	SR-22 EB On/Off Ramp	Studebaker Rd	Existing Traffic Signal	0.97	30.9	C	0.98		F
29	SR-22 WB On/Off Ramp	College Park Dr	Unsignalized Intersection	0.62	28.6	0	0.99	172.9 39.9	D
30	7th St	Pacific Coast Highway	Existing Traffic Signal		51.2	D_	0.99	46.3	D
31	7th St	Beliflower Blvd	Existing Traffic Signal	1.09	74.9	_	0.98	19.3	B
32	Pacific Coast Highway	Bellflower Blvd	Existing Traffic Signal	0.51	39.7	C	0.96	24.8	C
33	7th St	Channel Dr	Existing Traffic Signal	D.73 0,82	45.2	D	0.96	41.7	D
34	7th St	W. Campus Dr	Existing Traffic Signal	0,82	45.2	U	0.83	94./	L D _

					,			
	Loc	ation				2020 Alternati		
No.	East/West Street	North/South Street	Movement	Available Storage (ft)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No
_			SBL	300	203	Yes	335	No
1	Carson St	I-605 SB Off Ramp	SBT	1.130	126	Yes	183	Yes
-	CE1301134	r-ous so on themp	SSR	300	256	Yes	195	Yes
			NBL	300 (650)	230	Yes	285	Yes
3	Carson St	I-605 NB Off Ramp	NBR	300(1175)	220	Yes	155	Yes
_			NBL	120	315	No	332	No
			SBL	140	57	Yes	72	Yes
4	Carson St	Pioneer Blvd	SBR	140	77	Yes	85	Yes
			EBL	250	297	No	372	No
			WBL	80	15	Yes	16	Yes
			53L	220 (1240)	274	Yes	155	Yes
5	Spring St/Cerritos Ave	I-605 SB Off Ramp	SBR	900	0	Yes	Q	Yes
5	Spring St/Cerritos Ave	1-605 NB On Ramp	WBL	260	196	Yes	145	Yes
			NBL.	180	130	Yes	137	Yes
9	Willow St	Lakewood Blvd	SBL	150	50	Yes	119	Yes
9	Willow 25	Lakewood Blvd	FBL	175	56	Yes	74	Yes
			WBL	150	39	Yes	143	Yes
			WBL	1,870	102	Yes	181	Yes
11	I-405 NB Off Ramp	Beltflower Blvd	WBL/T/R	1,130	59	Yes	182	Yes
			WBR	410	53	Yes	165	Yes
			NBL	150	289	No	79	Yes
12	Willow St	Bellflower Blvd	SBL	120	189	No -	246	No
14	ANIIIOM 25	Belliower alvo	EBL	140	147	No	125	Yes
			WBL	110	183	No	311	No
			NBL	160	23	Yes	43	Yes
13	Los Coyotes Diagonal	Bellflower Blvd	NBR	230	49	Yes	147	Yes
15	LOS COYOLES DIAGONA!	belifiower bivo	EBL	190	316	No	583	No
			WBL	150	197	No	207	No
15	Los Coyotes Diagonal	I-405 SB Direct Off Ramp	SBL	1525 (500)	137	Yes	260	Yes
			SBL	120	156	No	355	No
16	Willow St	Los Coyotes Diagonal	EBL	140	159	No	54	Yes
			WBL	160	329	No	697	No
			NBL	140	982	No	393	No
			NBR	60	22	Yes	9	Yes
17	Willow St	Woodruff Ave	SBL	120	74	Yes	29	Yes
		***************************************	SBR	120	21.1	No	56	Yes
			EBL	200	351	No	411	No
			WBL	180	191	No	108	Yes
20	i-405 NB Direct Off Ramp	Palo Verde	WBL	550	327	Yes	172	Yes
			WBT/R	1,155	68	Yes	236	Yes
21	Woodruff Ave	Palo Verde	EBL.	335	257	Yes	207	Yes
-			EBR	335	290	Yes	227	Yes
			NBL	130	161	No	165	No
22	Steams St	Palo Verde	SBL	120	92	Yes	112	Yes
		/	EBL	90	168	No	164	No
			WBL	80	44	Yes	112	No
24	1-405 NB Direct On Ramp	Studebaker Rd	NBL	100	68	Yes	51	Yes
			SBR	70	16	Yes	16	Yes

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I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

	loca	tion			1	2020 Alternativ	ve 2 Condition	6
М	100					ak Haur		ak Hour
No.	East/West Street	North/South Street	Movement	Available Storage (ft)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No)
			NBL	200	55	Yes	56	Yes
			SBL	260	1	Yes	4	Yes
26	Atherton St	Studebaker Rd	SBR	70	16	Yes	21	Yes
			ESL.	120	79	Yes	223	No
	Tr. or		WBL	220	29	Yes	26	Yes
250			NBR	150	14	Yes	23	Yes
27	5R-22 WB On/Off Ramp	Studebaker Rd	SBL	200	81	Yes	226	No
			NBR	300	1212	No	1035	No
28	SR-22 EB On/Off Ramp	Studebaker Rd	SBL	150	368	No	242	No
			WBR	60	62	No	223	No
			NBL	330	155	Yes	239	Yes
30	7th St	Pacific Coast Highway	SBL.	290	288	Yes	390	No
			NBR	130	99	Yes	40	Yes
	7th St		SBL	160	196	No	237	No
31	7th St	Beliflower Blvd	SBR	160	87	Yes	352	No
			EBL	200	491	No	395	No
- 1			WBL	200	36	Yes	58	Yes
			NBL	280	88	Yes	70	Yes
			SBL	240	226	Yes	208	Yes
	and the second s		SBR	50	17	Yes	31	Yes
32	Pacific Coast Highway	Belifiower Blvd	EBL	110	54	Yes	118	'No
			WBL	129	53	Yes	59	Yes
			WBR	200	65	Yes	41	Yes
			EBL	270	107	Yes	27	Yes
33	7th St	Channel Dr	EBR	180	22	Yes	6	Yes
			WBL	280	105	Yes	258	Yes
	art ex		SBL/R	150	70	Yes	212	No
34	7th St	W. Campus Dr	EBL	400	80	Yes	24	Yes
			SBL	150	78	Yes	183	No
_	0.75		SBT/R	150	69	Yes	108	Yes
35	7th St	E. Campus Dr	EGL	150	207	No	95	Yes
			WBL	300	77	Yes	120	Yes

## **GL-9 (Continued)**

I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

_								2) 1 000	
	Loc	ation					Year 204		
					Avg Delay			A Peak Ho Avg Delay	
No.	East/West Street	North/South Street	Traffic Control/Comments	D/C	(sec)	LOS	D/C	(sec)	LO
1	Carson St	1-605 SB Off Ramp	Existing Traffic Signal	0.63	19.3	В	0.73	21.0	0
		I-605 SB Direct On Ramp	Unsignalized On Ramp	0.26			0.34	_	-
2	Carson St	I-605 SB Loop On Ramp	Unsignalized On Ramp	0.40			0.39		-
		I-605 NB Off Ramp	Existing Traffic Signal	0.65	21.9	¢	0.81	18.1	8
		I-605 NB Loop On Ramp	Unsignalized On Ramp	0.35	**	**	0.39		
3	Carson St	I-605 NB Direct On Ramp	Unsignalized On Ramp	0.55			0.49		
4	Carson St	Pioneer Blvd	Existing Traffic Signal	88.0	41.9	D	0.93	39.0	D
5	Spring St/Cerritos Ave	I-605 SB Off Ramp	Existing Traffic Signal	0.74	15,7	8	0,62	10.8	В
6	Spring St/Cerritos Ave	I-605 NB On Ramp	Existing Traffic Signal	0.75	8.7	А	0.81	8.6	A
	I-405 NB Direct Off Ramp		Unsignalized Off Ramp	0.46			0.45	-	
	1-405 NB Direct On Ramp		Unsignalized On Ramp	0.43		-	0.21		-
	1-405 NB Loop Off Ramp		Unsignalized Off Ramp	0.25			0.25		
7	:-405 NB Loop On Ramp	Lakewood Blvd	Unsignalized On Ramp	0.58			0.44		
	1-405 SB Loop On Ramp		Unsignalized On Ramp	0.24	**		0.27	-	
8	1-405 SB Direct Off Ramp	Lakewood Blvd	Unsignalized Off Ramp	0.45			0.51	-	
9	Willow St	Lakewood Blvd	Existing Traffic Signal	0.79	32.2	C	1.02	52,0	0
		I-405 SB Loop Off Ramp	Unsignalized Off Ramp	0.36			0.49	-	- 1.0
10	Williaw St	I-405 SB Direct On Ramp	Unsignalized On Ramp	0.34			0.46	-	-
	I-405 NB Off Ramp		Existing Traffic Signal	0.57	11.3	В	0.58	12.2	В
	I 405 NB Loop On Ramp		Unsignalized On Ramp	0.56			0.39	_	-
11	I-405 NB Direct On Ramp	Bellflower Blvd	Unsignalized On Ramp	0.32			0.19	-	-
12 -	Willaw St	Belifigwer Blvd	Existing Traffic Signal	1.05	55.0	D	1.25	106.3	F
		Beliflower Blvd	Existing Traffic Signal	0.67	27.7	C	1.13	54.2	D
13	Los Coyotes Diagonal	I-405 SB Direct On Ramp	Unsignalized On Ramp	80.0			0.15	_	_
14	I-105 SB Loop Off Ramp	Beliflower Blvd	Unsignalized On Ramp	0.13			0.27	_	
		I-405 SB Direct Off Ramp	Existing Traffic Signal	0.55	11.0	В	0.52	14.8	В
15	Los Coyotes Diagonal	I-405 S8 Loop On Ramp	Unsignalized On Ramp	0.33	-	-	0.21		
16	Willow St.	Los Coyotes Diagonal	Existing Traffic Signal	0.95	50.7	Е	1.41	101.4	F
17	Willow St	Woodruff Ave	Existing Traffic Signal	1.53	242.2	F	0.95	81.3	F
	I-405 NB Direct Off Ramp		Unsignalized Off Ramp	0.47	-	-	0.25	-	
18	1-405 NB Direct On Ramp	Woodruff Ave	Unsignalized On Ramp	0.31			0.23	_	_
	1-405 SB Direct Off Ramp		Unsignalized Off Ramp	0.55		_	0.50		_
19	I-405 S3 Direct On Ramp	Woodruff Ave	Unsignalized On Ramp	0.47	-		0.28	_	
	I-405 NB Direct Off Ramp		Existing Traffic Signal	0.82	17.4	В	0,72	13.3	В
20	1-405 NB Loop On Ramp	Paio Verde	Unsignalized On Ramp	0.11	-		0.20		
21	Woodruff Ave	Palo Verde	Existing Traffic Signal	D.89	15.9	В	0.76	12.1	В
22	Steams St	Paio Verde	Existing Traffic Signal	0.91	20.3	c	0.92	23.9	- 6
23	Steams St	I-405 SB Direct On Bamp	Unsignalized On Ramp	0.31		-	0.43		
24	I-405 NB Direct On Ramp	Studebaker Rd	Existing Treffic Signal	0.58	3.6	- A	0.56	2.8	A
25	I-405 SB Direct Off Ramp	Studebaker Rd	Unsignalized Intersection	1.04	81.3	F	0.65	33.1	
26	Atherton St	Studebaker Rd	Existing Traffic Signal	0.65	9.5	A	0.86	17.1	В
27	SR-22 WB On/Off Ramp	Studebaker Rd	Existing Yraffic Signal	0.54	13.4	В	0.89	31.8	c
28	SR-22 EB On/Off Ramp	Studebaker Rd	Existing Traffic Signal	1.06	45.2	D	1.09	43.9	
29	SR-22 WB On/Off Ramp	College Park Dr	Unsignalized Intersection	0.75	38.1	ε	1.59	311.8	F
30	7th St	Pacific Coast Highway	Existing Traffic Signal	1.04	70.0	E	1.07	64.9	-
31	7th St	Beliflower Blvd	Existing Traffic Signal	1.18	92.7	F	1.07	60.9	-
32	Pacific Coast Highway	Bellflower Blvd	Existing Traffic Signal	0.55	40.2		0.74	31.4	-
33	7th St	Channel Dr	Existing Traffic Signal	0.79	25.4	C	1.04	55.7	E
34	7th St	W. Campus Dr	Existing Traffic Signal	0.79	68.4	E	0.90	66.0	-
35	7th St	E. Campus Dr	Existing Traffic Signal	1.17	68.7	E	0.99	19.0	В

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1-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

	Loc	ation		T		2040 Alternati	ve 2 Condition	ie.
		1				ek Hour		sk Hour
No.	East/West Street	North/South Street	Movement	Available Storage (ft)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No.
			SBL	300	223	Yes	372	No
1	Carson St	1-605 SB Off Hamp	SBT	1,130	139	Yes	201	Yes
			SBR	300	286	Yes	215	Yes
3	Carson St	I-605 NB Off Ramp	NBL	300 (650)	252	Yes	312	Yes
2	Edison at	POUS NO LIT NAME	NBR	300(1175)	245	Yes	167	Yes
			NBL	120	348	No .	366	No
		1	SBL	140	60	Yes	78	Yes
4	Carson St	Pioneer Blvd	SBR	140	82	Yes	88	Yes
			EBL	250	328	No	405	No
			WBL	80	15	Yes	16	Yes
5	Common Da IC or man an Aven	L COC CD Off Paren	SBL	220 (1240)	289	Yes	161	Yes
2	Spring St/Cerritos Ave	I-60S SB Off Ramp	SBR	900	0	Yes	0	Yes
6	Spring St/Cerritos Ave	I-605 NB On Ramp	WBL	260	211	Yes	159	Yes
			NBL	180	140	Yes	160	Yes
9	Willow St	Laborated Dhal	SBL	150	58	Yes	132	Yes
9	William 25	Lakewood Blvd	EBL	175	65	Yes	85	Yes
		1	WBL	150	46	Yes	167	No
			WBL	1,870	109	Yes	194	Yes
11	I-405 NB Off Ramp	Bellflower Blvd	WBL/T/R	1,130	70	Yes	209	Yes
			WBR	410	66	Yes	189	Yes
			NBL	150	314	No	77	Yes
	1418	0.00	SBL	120	206	No	268	No
12	Willow St	Beliflower Blvd	EBL	140	161	No	144	No
			Wal	110	186	No	329	No
			NBL	160	25	Yes	47	Yes
			NBR	230	50	Yes	185	Yes
3	Los Coyotes Diagonal	Bellflower Blvd	EBL	190	346	No	643	No
			WBL	150	200	No	225	No
5	Los Coyotes Diagonal	1-405 SB Direct Off Ramp	SBL	1525 (500)	143	Yes	277	Yes
			SBL.	120	193	No	405	No
6	Willow St	Los Coyotes Diagonal	EBL	140	169	No	54	Yes
			WBL	160	358	No	762	No
П			NBL	140	1069	No	436	No
			NBR	60	23	Yes	9	Yes
			SBL	120	81	Yes	31	Yes
7	Willow St	Woodruff Ave	SBR	120	239	No -	58	Yes
		l i	EBL	200	379	No	455	No
			WBL	180	211	No	116	Yes
	1 405 NO BL		WBL	550	366	Yes	188	Yes
10	I-405 NB Direct Off Ramp	Palo Verde	WBT/R	1,155	89	Yes	285	Yes
	W - / F 1		EBL	335	304	Yes	228	Yes
1	Woodruff Ave	Palo Verde	EBR	335	329	Yes .	292	Yes
			NBL	130	177	No	181	No
			SBL	120	89	Yes	102	Yes
2	Stearns St	Palo Verde	EBL	90	187	No	185	No
		l i	WBL	80	49	Yes	127	No
			NBL	100	68	Yes	51	Yes
24	1-405 NB Direct On Ramp	Studebaker Rd	SBR	70	18	Yes	17	Yes

## **GL-9 (Continued)**

I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

	Local	tion			1	2040 Alternativ	re 2 Condition	6
	5000				AM Pe	ak Hour	PM Per	ak Hour
No.	East/West Street	North/South Street	Movement	Available Storage (ft)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No
$\neg$			NBL	200	99	Yes	76	Yes
- 1			SBL	260	2	Yes	4	Yes
18	Atherton St	Studebaker Rd	SBR	70	18	Yes	21	Yes
-			EBL	120	85	Yes	248	No
ı			WBL	220	31	Yes	27	Yes
			NBR	150	15	Yes	24	Yes
27	SR-22 WB On/Off Ramp	Studebaker Rd	SBL	200	90	Yes	250	No
			NBR	300	1396	No	1201	No
28	SR-22 EB On/Off Ramp	Studebaker Rd	SBL	150	401	No	257	No
	ar ee eo onyon namp	010000000000000000000000000000000000000	WBR	60	64	No	312	No
			NBL	330	165	Yes	252	Yes
10	7th St	Pacific Coast Highway	SBL	290	324	No	145	No
_			NBR	130	133	No	45	Yes
			SBL	160	203	No	259	No
31	7th St	7th St Bellflower Blvd	SBR	160	90	Yes	448	No
-			EBL	200	509	No	366	No
			WBL	200	36	Yes	62	Yes
			NBL	280	94	Yes	73	Yes
			SBL	240	275	No	203	Yes
			SBR	50	18	Yes	34	Yes
32	Pacific Coast Highway	Bellflower Blvd	EBL	110	55	Yes	127	No
			WBL.	120	56	Yes	65	Yes
			WBR	200	75	Yes	42	Yes
			EBL	270	108	Yes	24	Yes
33	7th St	Channel Dr	EBR	180	20	Yes	59	Yes
			WBL	280	105	Yes	264	Yes
-			S9L/R	150	75	Yes	234	No
34	7th St	W. Campus Dr	EBL	400	79	Yes	2.4	Yes
			SBL	150	84	Yes	213	No
			SBY/R	150	71	Yes	128	Yes
35	7th St	E. Campus Dr	EBL	150	210	No	99	Yes
			WBL	300	80	Yes	147	Yes

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I-405 Improvement Project Supplemental Traffic Study

## **GL-9 (Continued)**

Long Beach Area Traffic Study

			N	tainline			Altemati	ve 2 (Ya	er 2020) Car	nditions		
	1		-			****			1		-611	
Location	Type Type	Direction	Lanes	Capacity <sup>1,4</sup>	Traffic Demand Volume <sup>1</sup>	D/C	Density <sup>2</sup>	LOS <sup>3</sup>	Traffic Demand Volume <sup>1</sup>	D/C	Density <sup>2</sup>	LOS
				1-483 Ms								
	GP.	NB	.5	9,250	9,500	1.04	42.1	E	10,060	1.09	43.6	E
Temple Avenue to	ur.	58	5	9,250	9,550	1.04	35.9	E	10,030	1.08	-,4	F
Lakewood Boulevard/Willow Street	HOV	MB	1	1,850	2.040	1.10	-	-	2,290	1.23	-	
	HOW	SB	1.	1,850	1,920	1.04	100	-	1,810	0.58		-
	čo.	NB	5	9,250			Unearuing S	egment -	Refer to Wes	ne Yable		
Lakewood Boulevard/Willow Street to	GP	58	5	9,250			Weaving S	egment -	Refer to Wes	ve Table	N. BORE	
Beliflower Boulevard		NB	1	1,850	1,980	1.07	1 - 1	-	2,240	1.21	- 1	-
	HOV	SB	1	1,850	1,920	1.04		-	1,810	0.98	127	-
		NB	5	9,250			Weaving 5	egment -	Refer to Wes	ne Table		
Bellflower Goulevard to	GP	SB	5	9,250					Refer to Wes		2.000	2000
Woodnuff Avenue		NB	1	1.850	2,050	1.11	T - I	-	2.240	1.21	1 - 1	-
TTOO IN THE PERSON	HOV	SB	1	1,850	1,920	1.04	-	_	1,810	0.98	-	-
		NB NB	5	8,250	1,760	2.0%		armant.	Refer to Wes		-	
Woodnuff Avenue to	GP	58	4	7,100	8,720	1.18		E.	I 8.920 1	1.21	- 1	F
Palo Verde Avenue/Stearns Street	_	NB NB	1	1,850	2,050	1.10	-		2,050	1.11	-	
Palio verde Avenue/Stearns Street	HOV	an 1.5 an							-		-	_
		SB	1	1,850	2,160	1.17	44		2,023	1.00	-	-
	GP	NB	5	9,250	. Seamers				Refer to Was			
Palio Verde Avenue/Stearns Street to		SB	5	9,250			Weaving S	egment -	Refer to Wea			
Studebaker Road	HOV	N9	1	1,850	2,030	1.10	-	- 14	2,340	1.25	-	-
		58	1	1,850	2,210	1.19	- 1	-	2,020	1.09	-	-
	6P	NB	. 6	7,400	8,850	1.20			10,130	1.37		r
Studebaker Road to	- Car	SB	5	9,250	8,710	0.94	30.7	D	9,150	0.99	58.9	E
I-GOS NB Off Ramp	HOV	NB	1	1,850	2,300	1.24	-	***	2,710	1.45	-	-
	HUV	SR	1	1,850	2,210	1.19	-	**	2,010	1.09	-	-
	69	NB.	1	7,403	7,210	0.99	39.0	E	8,700	118	_0	F
	GP.	58	4	7,400	7,480	101	34.4	D	8,180	130		F
1-605 NB Off Ramp to 7th St Off Barap		NB.	1	1,850	2,300	1.24	-	-	2,710	1.46	-	-
	HCV	58	1	1,650	2,210	1.19	-	_	2,360	1.28		-
		NB.	4	7,400	7,840	0.99	88.0		8,700	1.88		- 6
CONTRACTOR OF THE PROPERTY OF	6P	59	4	7,400	7,899	100	33.7	D	8,043	109		F
7th St Off Ramp to 1-605 SB On Ramp	-	NB NB	1	1,850	2,800	1.24	337		2,710	1,45	-	-
	HOV	SB	1	1,850	2,210	1.19	-	-	2,710	1.28	- 1	-
		38	1	1-605 Ma		7.13	- 1	-	4,360	2.28		_
		1 100	4	7,100	5.510	0.75	741	•	6.490	388	31.3	D
Carson Steet to	GP	NB SB	4	7,400	8,000	1.03	40.4	F	7,400	1.00	36.0	E
Spring Street		NB	1	1,850	1,570	0.85	10.4		2,040	1.10	504	-
during our core	HOV	SB	1	1,850	2,020	1.09	-	-	1.800	0.97	-	-
1		NB	4 :	7,400	4,810	0.65	15.5	C	5,450	0.74	22.8	C
Spring Street to	Eb.	SB	4	7,400	6,960	D54	30.4	D	5,970	081	247	C
Willow Street/Katella Ave	1101	NB	1	1,850	1,850	1.00	4.0		2,450	1.82	-	-
	HOV	58	1	1,850	2,240	1.21	-		2,000	1.08	-	_
2 - 2 - 2 2 - 1 - 1 - 1 - 1	GP	NB	5	9,250	4,810	925	15.9	В	5,880	061	20.5	Ç
Willow Street/Katella Ave CD Road On	City	SB	4	7,400	5,910	0 80	15.5	C	5,170	0.70	248	•
Ramp to 1-405	HOV	NE	1	1,850	1,490	0.81	-	-	2,000	1.08	-	-
	HUV	SB	1	1,850	1,770	0.96	-	-	1,580	0.85		
		-		7th Street P	Ministration of the same		- 1000			1		
Pegper Tree Lime to Studebaker Road	GP	EB	2	3,700	3.180	0.86	170	. 6	2,770	0.75	14.8	- 8
												6
		WB EB	3	5,550 8,700	4,010	0.72	21.5	C F	3,080	0.55	165	D

- rect:

  1. Peak hour capacity and traffic volumes are aboven in vehicles per hour (vph).

  2. Desity is shown in passenger ceru/mis/fare (sc/m/l/s).

  3. Level of Factor (LDVG General Purpose (FV) lines based on density except when demand-to-capacity (DVC) ratios greater than or equal to 1.0, which is LOS F.

  4. Peak hour capacities for ferowey lance include 7,850 uph for each GP lance and a single-righ. Occupancy Vehicle (HDVV) lance.

  5. \*\*Desally is in excessed of 59 points, therefore LOS in the second capacities for excessed of 50 points, therefore LOS in the second capacities for excessed of 50 points, therefore LOS in the second capacities for excessed of 50 points, therefore LOS in the second capacities for excessed of 50 points, therefore LOS in the second capacities for the second

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## **GL-9 (Continued)**

					l						
_	Table 4.5-6: Alternative 2 (Year 2020) Ramp Junction Peak Hour Level of Service	(Year 2	020) Ra	mp June	tion P	eak Hou	r Level	of Servi	9		
	-					Alterna	tive 2 (Yea	Alternative 2 (Year 2020) Conditions	iditions		
		_			AM	AM Peak			PM	PM Peak	
Interchance	Ramo Tuno	Ramp	Ramp		Ramp	Ramp )	Ramp Junction	Rai	Ramp	Ramp	Ramp Junction
2000		Lanes	Capacity	Traffic Volume <sup>‡</sup>	۵/ر	Density <sup>2</sup>	re\$07	Traffic Volume <sup>1</sup>	2/4	Density <sup>2</sup>	10535
		1	405 Ramp	405 Ramp Junctions							
	NB Off Direct	2	3,000	970	0.32	13.6	80	960	0.32	15.5	89
	NB On Loop	*1	1,500	800	0.53	45.0	u	610	0.41	50.5	4
Lakewood Blvd	NB On Direct	11	1,500	290	0.39	24.9	U	280	0.19	27.3	U
& Willow St	SB Off (Direct + Loop)	7	3,000	1,120	0.37	17.5	8	1,380	0.46	20.1	-
	SB On Loop	,-	1,500	300	0.20	42.5	ı	370	0.25	42.9	-
	SB On Direct (from Willow St)	-	1,500	470	0.31	22.0	u	640	0.43	22.3	U
	NB Off Direct	1	1,500	230	0.35	27.0	U	570	0.38	32.0	0
Bellflower Blvd &	NB On (Direct + Loop)	2	3,000	1,220	0.41	14.0		810	0.27	13.1	-
Los Coyotes Diagona	SB Off (Direct + Loop)	2	3,000	1,420	0.47	17.2	æ	1,920	0.54	21.5	U
	SB On (Direct + Loop)	1	1,500	930	0.62	35.2	4	1,460	0.97	33.9	-
	NB Off Direct	1	1,500	650	6,43	23.9	J	350	0.23	26.4	u
Washington Mr. D.	NB On Direct	4-4	1,500	024	0.29	34.9	1	310	0.21	414	-
Avood In Sec	SB Off Direct		1,500	750	0.50	29.4	۵	620	0.41	29.9	٥
	SB On Direct	1	1,500	099	0.44	23.1	u	350	0.23	24.7	-
	NB Off Direct	++	1,500	650	0.43	24.7	U	750	0.50	29.4	-
Palo Verde Ave	NB On Loop	-	1,500	150	0.10	53.6		280	0.19	60.7	-
o steam se	Sa On Direct (from Stearn St)	1	1,500	420	0.28	26.7	L	530	0.35	26.8	ш.
Charleston	NB On Direct	**	1,500	350	0.23	55.1	u.	270	0.18	63.9	4
Studensker va	SB Off Direct	11	1,500	420	0.28	35.4	w	300	0.20	35.8	-
27.52	SB Off Direct	-	1.500	9	900	34.7	-	120	800	37.8	ľ

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Density<sup>2</sup>

Traffic Volume<sup>1</sup>

Ramp

Ramp Type

Spring St/Cerritos Ave

Willow St/Katells Ave

,	U		J	U	-	ш	∢	J	0	_	U	_	۵	-	v
7 77	22.0	15.3	21.4	21.7	19.4	35.6	5.1	20.8	31.0	30.9	21.7	30.3	32.2	42.6	22.4
000	0.46	0.49	0.30	0.21	0.69	0.95	1.09	0.93	0.39	0.68	0.53	0.49	0.95	0.97	0.34
2	690	1,480	450	320	1,040	1,430	1,630	1,400	280	1,020	800	730	1,430	1,460	510

EB Off Loop WB Off Loop WB On Loop

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**GL-9 (Continued)** 

						Alterna	tive 2 (Yea	Alternative 2 (Year 2020) Conditions	ditions		
					AM	AM Peak			PM	PM Peak	
Integralia nees	and amed	Ramp	Ramp <sup>1.4</sup>	Rar	Ramp	Ramp	Ramp Junction	Ramp	du	Ramp	Ramp Junction
	and the same of th	Lanes	Capacity	Traffic Volume <sup>1</sup>	2/0	Density <sup>2</sup> LOS <sup>3,5</sup>	5/ES01	Traffic Volume <sup>2</sup>	3/0	Density <sup>2</sup>	, son
	Œ	Freeway - to - Freeway Branch Connectors	- Freeway	Branch Co	onnectors	. 5					
	1-605 SB to 1-405 NB	ĭ	1,800	790	0.44	1	ı	096	0.53	-	-
	1-605 SB/7th St to 1-405 NB	2	3,600	1,500	0.42	,	1	1,440	0.40	,	٠
	I-405 SB to I-605 NB	2	3,600	1,250	0.35	,	,	980	0.27	,	,
1-405/1-605	1-605 SB to 7th St/1-405 SB	2	3,600	5,120	1.42			4,210	1.17	;	1
reeway merchanges	I-605 SB/I-405 SB to 7th St	1	1,800	2,050	1.14	1		1,040	0.58	-	-
	7th St to 1-605 NB/1-405 NB	2	3,600	1,060	0.29	1		1,230	0.34	-	-
	7th St to I-405 NB	1	1,800	720	0.40	,		420	0.23		,

Table 4.5-6: Alternative 2 (Year 2020) Ramp Junction Peak Hour Level of Service

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March 2015

Long Beach Area T

Table 4.5-6: Alternative 2 (Year 2020) Ramp Junction Peak Hour Level of Service

ent Project Supplemental Traffic Study

I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

Table 4.5-7: Alternative 2 (Year 2020) Weaving Level-of-Service Freeway and Collector-Distributor Roads

	AM Pea	k Hour	PM Peal	Hour
Weaving Segment	Density	LOS <sup>2</sup>	Density <sup>1</sup>	LO5 <sup>2</sup>
Freeway Mainline				
I-405 Southbound - Lakewood Boulevard/Willow Street to Bellflower Boulevard	45.4	F	70.9	F
I-405 Northbound - Bellflower Boulevard to Lakewood Boulevard/Willow Street	47.7	F	41.3	Е
I-405 Southbound - Bellflower Boulevard to Woodruff Avenue	41.2	E	68.0	F
I-405 Northbound - Woodruff Avenue to Bellflower Boulevard	52.4	F	47.8	F
I-405 Northbound - Palo Vorde Avenue/Stearns Street to Woodruff Avenue	46.9	F	40.8	E
I-405 Southbound - Palo Verde Avenue/Steams Street to Studebaker Road	33.1	D	43.9	F
I-405 Northbound - Studebaker Road to Paío Verde Avenue/Stearns Street	45.1	F	45.4	F
Collector-Distributor (C-D) Roads				
Lakewood Boulveard/Willow Street Interchange at I-405				
Southbound C-D Road	16.2	В	22.5	С
Beliflower Boulevard/Los Coyotes Diagonal Interchange at I-405				
Southbound C-D Road	5.0	А	3.8	Α

#### Notes:

- 1. Density is shown in passenger cars/mile/lane (pc/mi/ln).
- 2. Level of Service (LOS) is based on density (pc/mi/ln). The density LOS thresholds are different for the freeway mainline and collector-distributor roads.

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## **GL-9 (Continued)**

I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Truffic Study

			M	lainkoe			Alternati	we 2 (Ye	ar 2040) Con	ditions		
			-			AM P	enk Hour	_			ak Hour	_
Location	Type	Direction	Lanes	Capacity <sup>3,4</sup>	Traffic Dentand Volume	D/C	: Density <sup>3</sup>	ros3	Traffic Demand Volume <sup>1</sup>	D/C	Density'	LO
				1-485 Ma					- Value		L	-
		NB	5	9,250	10,870	1.12	*	F	13.870	1.18		F
Yample Avenue to	GP	SD	5	9,250	10.440	113	43.2	3	10.840	1.17	-4	- 1
Lakewood Boulevard/Willow Street	HOV	NB	1	1,850	2,200	1.19			2,460	2.55	100	-
	nov	SB	1	1,85€	2,070 i	1.12	-	-	1,960	1,06		_
	GP	NB	5	9,250					Refer to Wea			
Lakewood Boulevard/Willow Street to	o,	SB	5	9,250			Weaving 2	egment-	Refer to Wes			
Beliflower Boulevard	HOV	NB	1	1,850	2,140	1.16	-	-	2,420	1.31		_
		SB	1	1,85C	2,070	1.12			1,960	1.06		_
	GP	NB	5	9,250					Refer to Wive			
Bellflower Boulevard to	1	59	. 5	9,250	,		Weaving 5		Refer to Wea			
Woodroff Avenue	HOV	NB	1	1,850	2,220	1.20			2,420	1.31	-	_:
		SB	1	1.850	2,670	1.12			1,960	1.06	1	-
Manda M Accessor	GP	NB SB	5	9,250	0.440		Weaving 5		Refer to Wes		T-3-	-
Woodruff Avenue to		SB	4	7,400	9,440	1.28		F	9,640	1.30		- 1
Pallo Verde Avenue/Stearns Street	HOV	NB	1	1,850	2,190	1.18			2,220	1.20		-
	-	SB NB	5	9,250	2,330	1.26	- 1	-	Refer to West			_
Dale Manda Assessed Manager Consumer	GP								Refer to Wes			
Palo Verde Avenue/Stearns Street to Studebaker Road	-	SB NB	5	9,250	2,190	1.18	weeking t	offrigur-	2,540	1.87	1	-
Junet went! Flight	HO√	NR NR	1	1,850 1,850	2,390	1.18			2,180	1.19	-	
	_	NB NB	4	7,400	9,560	1.29	-	-	10,950	1.48	-	-
Studebaker Road to	GP	SB	5	9,250	9,450	1.02	35.1	E	9,590	1.07	14.7	9
1-605 NB Off Ramp		NB	1	1,95C	2,430	1.35	30.1	-	2,930	1.58	99.7	_
1000 110 011 110114	HOV	58	1	1,850	2,380	1.29	1 -		2.170	1.17	1 -	
	-	NB	1	7,400	7,940	1 07	45.0	-	9 400	1.27	-	
	GP	58	4	7,400	2,090	109	40.5	E	8,830	1.19	15-	
I-605 NB Off Ramp to 7th St Off Ramp		NB	1	1,850	2,490	1.33	40,0	-	2,930	1.58	-	
	HOV	SB	1	1,850	2,380	1.29	1		2,560	1.38	-	-
		NB	4	7,400	7,940	1.07	1 45.0	E	9,400	1.27		
	GP	58	4	7,400	7,990	1.08	30.4	£	8,590	1.17		-
7th St Off Ramp to I-605 SB On Ramp		NB.	1	1,850	2,490	1.85			2,980	1.58	-	
	HOV	SB	- î	1,850	2,380	1.29	-	-	2,560	1.38	-	-
			_	1-685 Mb					2,000		1000	
	GP	NB	4	7,400	5,990	0.81	26.2	. D	7,020	2,95	84.7	
Carson Steet to	J.	58	4	7,430	2,650	2.17			8.300	1.68	42.2	
Spring Street	HDV	NB	1	1,850	2,700	0.92	-	-	2,230	1.19		
		SB	1	1,85C	2,180	2.18	1 -	-	1,95C	1.05		_
Spring Street to	GP	N8 SB	4	7,400	5,21C 7,520	0.70	34.7	D D	5,900	0.80 0.87	27.2	- 5
Willow Street/Katella Ave	$\vdash$	NB NB	1	7,400 1,850	7,522 2,000	1.08	34.7		2,650	2.43	212	
THE PARTY OF THE P	HDV	SB	1	1,350	2,425	1.51	-	-	2.160	1.17	-	
	co	NB	5	9,250	5,200	0.56	17.2	В	6,140	0.66	22.3	0 6
Willow Street/Katella Ave CD Road On	GP	SB	4	7.400	6,39C	0.86	22.0	D	5,580	0.75	26.5	( 6
Ramp to I-405	HOV	NB		1,850	1,510	C.87	-	1	2,160	1.17	1	
	Linux	SB	1	1,850	1,910	1.03	-		1,710	0.92	-	
	-			7th Street 1					1	-		
Pepper Tree Lane to Studebaker Road	GP	E8	2	3,700	5,180	0,86	17.0	B	2,770	0.75	14.8	. !
		WB	. 2	3,550	4,010	0.72	21.5	C	3,080	0 55	30.4	_ 1
Studebaker Road to I-605	GP	EB	2	3,700	4,350	1.18		F	3,530	0.95	30 4	0

total:

2. Peak hour appetity and maffix volumes are shown to whildes per hour (wph).

2. Denity is shown in assessing or autylining/are to principle).

3. Denity is shown in assessing or autylining/are to principle).

3. Denity is shown in assessing or autylining/are to principle (and in the principle) and the principle (

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Ramp

Ramp Type

## **GL-9 (Continued)**

NB Off Direct
NB Con Loop
NB Con Loop
Se Off (Direct + Loop)

Lakewood Blvd & Willow St Palo Verde Ave & Stearn St

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## **GL-9 (Continued)**

		H				Alternal	tive 2 (Yes	Alternative 2 (Year 2040) Conditions	ditions		
		_			AN	AM Pesk			PM	PM Peak	
Cabonel control	Doctor Trees	Ramp	Ramp <sup>1,7</sup>		Ramp	Ramp Junction	unction	Rar	Ramp	Ramp	Ramp Junction
a Superior and the supe	add direct	Lanes	Capadity	Traffic Volume <sup>t</sup>	D/C	D/C Density <sup>2</sup> LOS <sup>315</sup>	105%	Traffic Volume <sup>1</sup>	D/C	Density <sup>2</sup>	100335
		I	505 Ramp	-605 Ramp Junctions	2						
	NB Off Direct	1	1,500	1,110	0.74	33.3	۵	1,060	0.71	37.4	E
	N8 On Loop	н	1,500	230	0.35	20.4	υ	280	0.39	23.6	U
,	N8 On Direct	-	1,500	830	0.55	20.8	u	740	0.49	23.1	J
Carson St	SB Off Direct	2	3,000	1,330	0.44	16.2	8	1,600	0.53	17.5	an
	SB On Loop	1	1,500	009	0.40	23.5	4	490	0.33	22.5	U
	SB On Direct	ч	1,500	300	0.20	24.5	u.	350	0.23	22.9	U
	NB On Loop	1	1,500	780	0.52	18.6	æ	1,120	0.75	20.0	8
Spring St/Cerritos Ave	SB Off Direct	-	1,500	1,130	0.75	38.2	ш	1,550	1.03	38.3	E
	NB Off (Direct + Loop)	-	1,500	1,140	0.76	9.0	٧	1,760	1.17	7.5	٧.
	NB On Direct	-	1,500	1,150	0.77	20.0	U	1,520	1.01	21.8	U
Willow St/Katella Ave	SB Off Direct	1	1,500	900	0.40	37.7	E	630	0.42	33.3	۵
	SB Off Loop	-	1,500	1,210	0.81	38.5	ш	1,110	0.74	33.2	٩
	SB On Direct (Direct + Loop)	1	1,500	0/9	0.45	26.2	o	870	0.58	23.1	C
		7th	Street Ran	7th Street Ramp Junctions	uş.						
	EB Off Loap	-1	1,500	210	0.14	34.3	۵	062	0.53	30.3	a
	EB On Loop	-	1,500	1,380	0.92	40.3	L	1,540	1.03	33.1	Q
Studebaker Kd	W8 Off Loop	н	1,500	870	0.58	43.4	u.	1,580	1.05	42.6	4
	We On Local		200	600	38.0	30.8	-	550	0.37	22.7	

Table 4.5-9: Alternative 2 (Year 2040) Ramp Junction Peak Hour Level of Service

1-405 impro

Los Table 4.5-9: Alternative 2 (Year 2040) Ramp Junction Peak Hour Level of Service

Long Beach Area Tr

ment Project Supplemental Traffic Study

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T.	Table 4.5-9: Alternative 2 (Year 2040) Ramp Junction Peak Hour Level of Service	rear 20	340) Ra	unf du	ction Pe	ak Hou	r Level	of Servi	l e		
							i				
						Alternal	ive 2 (Yea	Alternative 2 (Year 2040) Conditions	ditions		
					AM	AM Peak			PM	PM Peak	
Interchange	Rama Type	Ramp	Ramp <sup>3,4</sup>	Ramp	du	Ramp Junction	inction	Ramp	du	Ramp Junction	unction
		Lanes	Capachy	Traffic Volume <sup>2</sup>	D/C	Density <sup>2</sup>	100335	Traffic Volume <sup>1</sup>	D/C	Density <sup>2</sup> 105 <sup>2,5</sup>	5.2801
	Free	way - to	- Fraewa	Freeway - to - Fraeway Branch Connectors	physical						Γ
	I-605 SB to I-405 NB	1	1,800	850	0.47	-	;	1,040	0.58	1	,
	1-605 SB/7th St to 1-405 NB	2	3,600	1,630	0.45	,	١	1,550	0.43		,
1.405/1.605	1-405 SB to 1-605 NB	2	3,600	1,350	0.38	-		1,060	0.29		1
Freeway Interchanges	H605 SB to 7th St/1-405 SB	2	3,600	5,540	1.5	;	,	4,550	1.26		,
	1-605 SB/F-405 SB to 7th St	1	1,800	2,050	1.14	-	:	1,040	0.58	:	ı
	7th St to 1-605 NB/1-405 NB	2	3,600	510	0.14	;	,	380	0.11	1	Ī
	7th St to 1-405 NB	1	1,800	780	0.43	:	-	460	0.26	1	,

Long Beach Area Tr

... L. Peak hour capacity and traffic demand forecest volumes are shown in vehicle

2. Density is shown in passenger cars/mile/lane (pc/mi/n).

3. Level of Service (LOS) is besed on density (pd/m/ln); D/C - demand-to-capacity ratio. 8. Peak harr constitue for freezing remove levelude 1 RO west for each formula more level.

5. LOS F as the total flow of the merge/diverge erra exceeds the capacity of the freeway segment, the density is no 6. \* Per Highway Capacity Manual, as the immact area of marea and discense is oriented in consistent or an indiscense and

 Per Highway Capacity Manual, as the impact area of mer exceeding 1,500 ft in length.

I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

Table 4.5-10: Alternative 2 (Year 2040) Weaving Level-of-Service Freeway and Collector-Distributor Roads

**GL-9 (Continued)** 

	AM Peal	k Hour	PM Pea	Hour
Weaving Segment	Density <sup>1</sup>	LOS <sup>2</sup>	Density <sup>1</sup>	LOS
Freeway Mainline				
I-405 Southbound - Lakewood Boulevard/Willow Street to Beliflower Boulevard	50.3	F	78.3	F
I-405 Northbound - Bellflower Boulevard to Lakewood Boulevard/Willow Street	37.2	E	45.2	F
I-405 Southbound - Bellflower Boulevard to Woodruff Avenue	45.8	F	74.9	F
I-405 Northbound - Woodruff Avenue to Bellflower Boulevard	57.9	F	51.5	F
I-405 Northbound - Palo Verde Avenue/Stearns Street to Woodruff Avenue	51.7	F	45.1	F
I-405 Southbound - Palo Verde Avenue/Stearns Street to Studebaker Road	36.2	E	48.0	F
I-405 Northbound - Studebaker Road to Palo Verde Avenue/Steams Street	49.7	F	50.3	F
Collector-Distributor (C-D) Roads	J. His			
Lakewood Boulveard/Willow Street Interchange at 1-405				
Southbound C-D Road	16.2	В	22.5	С
Bellflower Boulevard/Los Coyotes Diagonal Interchange at I-405				
Southbound C-D Road	5.0	А	3.8	A

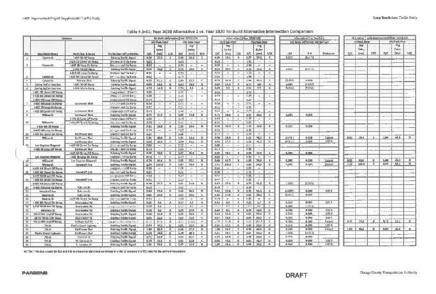
#### Notes:

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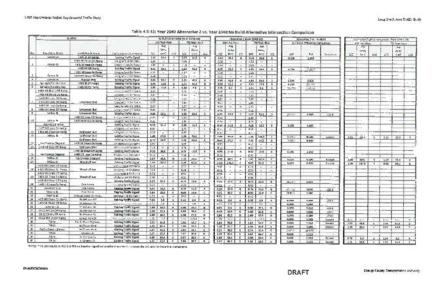
- 1. Density is shown in passenger cars/mile/lane (pc/mi/ln).
- Level of Service (LOS) is based on density (pc/mi/ln). The density LOS thresholds are different for the freeway mainline and collector-distributor roads.

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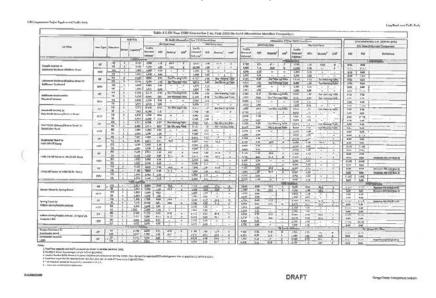
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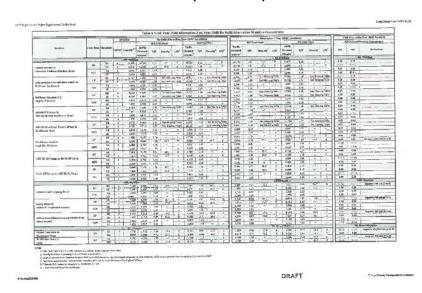


# **GL-9 (Continued)**



#### **GL-9 (Continued)**





I-405 Improvement Project Supplemental Traffic Study

Lung Beach Area Traffic Study

	Tal	ble 4.6-1 Alternative 3 (Year 20	120) Intersection Level of Service	ce - AM/I	PM Peak	Hours			
	Lo	cation	1 11111111111	I	Alte	mative 3	(Year 20)	201 LOS	_
			7	-	M Peak i			M Peak H	lour
	1			<u> </u>	Ave	7	-	Avg	T
		ļ	1	1	Delay			Delay	
Na	East/West Street	North/South Street	Traffic Control/Comments	D/C	(sec)	Los	D/C	(sec)	1.00
1	Carson St	I-605 SB Off Ramp	Existing Traffic Signal	0.64	11.1	В	0.74	13.0	В
		I-605 SB Direct On Ramp	Unsignalized On Ramp	0.24	-	- ·	0.32	13.0	-
2	Carson St	I-605 SB Loop On Ramp	Unsignalized On Ramp	0.33	T.,	-	0.37	-	
		I-605 NB Off Ramp	Existing Traffic Signal	0.61	20.9	C	0.37	17.6	В
	1	1-605 NB Loop On Ramp	Unsignalized On Ramp	0.28	120.5	1 -	0.30	- 27.6	- B
3	Carson St	1-605 NB Direct On Ramp	Unsignalized On Ramp	0.51		+-	0.36		-
4	Carson St	Pioneer Blvd	Existing Traffic Signal	0.76	31.7	C	0.43	31.8	c
5	Spring St/Cerritos Ave	I-605 SB Off Ramp	Existing Traffic Signal	0.70	14.4	В	0.60	9.8	A
6	Spring St/Cerritos Ave	1-605 NB On Ramp	Existing Traffic Signal	0.74	6.1	A	0.75	4.9	A
	I-405 NB Direct Off Ramp -		Unsignalized Off Ramp	0.44	- 5.1		0.73	4.3	-
	J-405 NB Direct On Ramp		Unsignalized On Ramp	0.38	<del>-</del>	<del> </del>	0.23	-	<del>-</del>
	I-405 NB Loop Off Ramp		Unsignalized Off Ramp	0.28		-	0.26	-	=
7	I-405 NB Loop On Ramp	Lakewood Blvd	Unsignalized On Ramp	0.52			0.26	1 =	_
	I-405 SB Loop On Ramp		Unsignalized On Ramp	0.23	<del> </del>	-	0.41	-	<del>-</del>
8	1-405 SB Direct Off Ramp	Lakewood Blvd	Unsignafized Off Ramp	0.23		-	0.45	-	_
9	Willow St	Lakewood Styd	Existing Traffic Signal	0.72	31,1	-	0.46	-	D
		1-405 SB Loop Off Ramp	Unsignalized Off Ramp	0.36	31,1	_	0.45	44.3	_
10	Willow St	1-405 SB Direct On Ramp	Unsignalized On Ramp	0.30	-		0.43		
-	I-405 NB Off Ramp		Existing Traffic Signal	0.41	9.1				-
	I-405 N8 Loop On Ramp		Unsignalized On Ramp	0.41	9.1	_^	0.53	11.1	B
11	I-405 NB Direct On Ramp	Bellflower Blvd	Unsignalized On Ramp	0.34		_	0.36		-
12	WillowSt	Bellflower Blvd	Existing Traffic Signal	0.32	22.0		0.18	-	_
	Willow St.	Bellflower Blvd	Existing Traffic Signal  Existing Traffic Signal		32.9	С	1.15	76.5	E
13	Los Coyotes Diagonal	I-405 SB Direct On Ramp		0.64	25.8	C	1.12	50.2	D
14	I-405 SB Loop Off Ramp	Bellflower Blvd	Unsignalized On Ramp Unsignalized On Ramp	0.09			0.12	-	_
	T 403 SO COOP ON HEIRD	I-405 SB Direct Off Ramp		0.12		-	0.37	-	
15	Los Covotes Diagonal	I-405 58 Loop On Rump	Existing Traffic Signal Unsignalized On Ramp	0.53	10.2	В	0.52	9.8	A
16	Willow St.	Los Coyotes Diagonal		0.32		-	0.17		
17	Willow St	Woodruff Ave	Existing Traffic Signal	0.75	40.9	D	1.26	66.5	E
~/	I-405 NB Direct Off Ramp	WOODIUM AVE	Existing Yraffic Signal	1.30	137.0	F	0.87	37.1	D
18	I-405 NB Direct On Ramp	Woodruff Ave	Unsignalized Off Ramp	0.40		-	0.22		-
	I-405 SB Direct Off Ramp	WOODIDII AVE	Unsignalized On Ramp	0.31	-		0.22		_
19	I-405 SB Direct On Ramp	Woodruff Ave	Unsignalized Off Ramp	0.52			0.41	-	
	I-40S NB Direct Off Ramp	Woodruit Ave	Unsignalized On Ramp	0.43			0.24	-	-
20	I-405 NB Loop On Ramp	Palo Verde	Existing Traffic Signal	0,84	17.0	В	0.69	11.8	В
21	Woodruff Ave	Palo Verde	Unsignalized On Ramp	0.14			0.22	_	
22	Stearns St	Palo Verde	Existing Traffic Signal	D.84	13.8	В	0.69	9.7	
23	Stearns St		Existing Traffic Signal	0.94	22.1	С	0.92	22,9	C
24	I-405 NB Direct On Ramp	1-405 SB Direct On Ramp	Unsignalized Intersection	0.35			0.46		
25	I-405 S8 Direct Off Ramp	Studebaker Rd	Existing Traffic Signal	0.63	4.1	Α	0.52	4.0	A
26	Atherton St	Studebaker Rd	Unsignalized Intersection	1.04	80.0	F	0.44	20.4	C
27	SR-22 WB On/Off Ramp	Studebaker Rd	Existing Traffic Signal	0.57	8.8	A	0.81	14.5	B
28	SR-22 EB On/Off Ramp	Studebaker Rd	Existing Traffic Signal	0.51	12.8	В	0.87	30.2	С
29	SR-22 WB On/Off Ramp	Studebaker Rd	Existing Traffic Signal	0.93	25.8	С	0.97	29.0	С
100		College Park Dr	Unsignalized Intersection	0.12	19.7	С	0.32	92.6	F
$\rightarrow$	7th St	Pacific Coast Highway	Existing Traffic Signal	0.92	35.7	D	0.96	36.9	D
11	7th St	Bellflower Blvd	Existing Traffic Signal	1.09	55.4	E	1.01	49.G	D
-	Pacific Coast Highway	Bellflower Blvd	Existing Traffic Signal	0.54	30.2	C	0.75	22.1	С
13	7th St	Channel Dr	Existing Traffic Signal	0.75	8.2	A	0.95	25.4	с
4	7th St	W. Campus Dr	Existing Traffic Signal	0.80	34.6	С	0.86	47.4	D
35	7th St	E. Campus Dr	Existing Traffic Signal	1.05	45.2	D	0.90	16.0	B.

# **GL-9 (Continued)**

I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

	Local	ion				2020 Alternativ	e 3 Concition	\$
ŀ	Lucai	IOH				ik Hour		ak Hour
No.	East/West Street	North/South Street	Movement	Available Storage (ft)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No
			SBL	300	136	Yes	193	Yes
1	Carson St	I-605 SB Off Ramp	SBT	1,130	78	Yes	95	Yes
			SBR	300	170	Yes	107	Yes
-		I-605 NB Off Ramp	NBL	300 (650)	229	Yes	280	Yes
3	Carson 5t	1-005 No Oli Katilp	NBR	300(1175)	232	Yes	141	Yes
$\neg$			NBL	120	244	No	270	No
- 1			SBL	140	77	Yes	78	Yes
4	Carson St	Pioneer Blvd	SBR	140	74	Yes	83	Yes
- 1			EBL	250	284	No	405	No
			WBL	80	17	Yes	18	Yes
5	Spring St/Cerritos Ave	L-605 SB Off Ramp	SBL	220 (1240)	281	Yes	159	Yes
			SBR	900	0	Yes	0	Yes
6	Spring St/Cerritos Ave	I-605 NB On Ramp	WBL	260	217	Yes	109	Yes
			NBL	180	134	Yes	137	Yes
9	Willow St	Lakewood Blvd	SBL	150	43	Yes	74	Yes
1			EBL	175	82	Yes	143	Yes
			WBL	150	31	Yes	175	Yes
			WBL	1,870	71	Yes	179	Yes
11	I-405 NB Off Ramp	Bellflower Blvd	WBL/T/R	1,130	56	Yes	162	Yes
_			WBR	410	362	No.	82	Yes
			NBL	150	0	Yes	252	No
12	Willow St	Beliflower Blvd	SBL		125	Yes	153	No
			EBL	140	246	No	338	No
			WBL	110	27	Yes	37	Yes
		ŀ	NBL NBR	230	50	Yes	159	Yes
13	Los Coyotes Diagonal	Bellflower Blvd	EBL	190	267	No	630	No
		}	WBL	150	160	No	163	No
	Les Country Diversed	1-405 SB Direct Off Ramp	SBL	1525 (500)	139	Yes	120	Yes
15	Los Coyotes Diagona	1-403 38 Direct Off Karily	SBL	120	166	No	367	No
15	Willow St	Los Coyotes Díagonal	EBL	140	87	Yes	51	Yes
10	WIIIOW SC	COS COSPORES DISSORIAN	WBL	160	346	No	673	No
-			NBL.	140	628	No	207	No
			NBR	60	36	Yes	26	Yes
			SBL	120	149	No	110	Yes
17	Willow 5t	Woodruff Ave	SBR	120	149	No	70	Yes
			EBL	200	292	No	161	Yes
			WBL	180	241	No	167	Yes
		Data Manda	WBL	550	376	Yes	283	Yes
20	1-405 NB Direct Off Ramp	Palo Verde	WBT/R	1,155	63	Yes	147	Yes
	IN- I-II A	Palo Verde	EBL	335	289	Yes	202	Yes
21.	Woodruff Ave	Palo Verde	EBR	335	286	Yes	169	Yes
			NBL	130	184	No	179	No
22	Ctenama St	Palo Verde	SBL	120	86	Yes	136	No
22	Steams St	Palo verde	EBL	90	231	No	214	Na
			MSF	80	40	Yes	115	No
24	I-405 NB Direct On Ramp	Studebaker Rd	NBL	100	82	Yes	63	Yes
24	PHOS NB DIFECT ON Hamp	Studenesses Ind	SBR	70	16	Yes	21	Yes_

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I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

	Loc	ation			T	2020 Alternati	ve 3 Condition	5
			1		AM Pe	ak Hour	PM Pe	ak Hour
No.	East/West Street	North/South Street	Movement	Available Storage (ft)	95th Percantile Queue (ft)	Adequate Storage? (Yes or No)	95th Parcentile Queue (ft)	Adequate Storage? (Yes or No
			NBL	200	-44	Yes	58	Yes
			SBL	260	1	Yes	2	Yes
26	Atherton St	Studebaker Rd	SBR	70	14	Yes	13	Yes
			EBL	120	79	Yes	223	No
			WBL	220	29	Yes	25	Yes
27	SR-22 WB On/Off Ramp	Studebaker Rd	NBR	150	14	Yes	27	Yes
	on the order reality	Storic Dakes Ma	SBL	200	66	Yes	131	Yes
			NBR	300	1110	No	1004	No
28	SR-22 E8 On/Off Ramp	Studebaker Rd	SBL	150	377	No	271	No
_			WBR	60	52	Yes	208	No
30	7th St	Pacific Coast Highway	NBL	330	189	Yes	252	Yes
-		Touris Count rightway	SBL	290	323	No 1	354	No
			NBR	130	81	Yes	27	Yes
			SBL	160	211	No	269	No
31	7th St	Beliflawer Blvd	SBR	160	95	Yes	362	No
		1	EBL	500	498	No	403	No
			WBL	200	39	Yes	58	Yes
- [			NBL	280	98	Yes	79	Yes
- 1			SBL	240	267	Na	218	Yes
32	Pacific Coast Highway	Bellflower Blvd	SBR	60	21	Yes	33	Yes
		DE-HIOMEI DIVE	EBL	110	33	Yes	131	No
- 1	1		W8L	120	56	Yes	60	Yes
-			WBR	200	65	Yes	41.	Yes
		I	EBL	270	105	Yes	27	Yes
33	7th St	Channel Dr	EBR	180	1	Yes	7	Yes
_			WBL	280	85	Yes	204	Yes
34	7th St	W Campus Dr	SBL/R	150	67	Yes	248	No
4		- Swingsward	EGL	400	209	Yes	48	Yes
			SBL	150	76	Yes	183	No
35	7th St	E. Camous Dr	SBT/R	150	68	Yes	108	Yes
		c. campus or	EBL	150	196	No	94	Yes
ᆚ			WBL	300	76	Yes	120	Yes

# **GL-9 (Continued)**

I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

					Altern	ation 2 /	Year 2040	LOS	
	Loca	ition		41.	Peak Ho			Peak Ho	ir.
No.	East/West Street	North/South Street	Traffic Control/Comments	D/C	Avg Delay (sec)	LOS	D/C	Avg Delay (sec)	LOS
1	Carson St	I-605 SB Off Ramp	Existing Traffic Signal	0.69	11.7	В	0.80	14.1	В
-	Carson St	1-505 SB Direct On Ramp	Unsignalized On Ramp	0.26			0.34	1	-
2	Carson St	I-605 SB Loop On Ramp	Unsignalized On Ramp	0.36			0.39	-	
-	Caraorist	I-605 NB Off Ramp	Existing Traffic Signal	0.66	22.9	С	0.81	19.4	В
- 1	F	I-605 NB Loop On Ramp	Unsignalized On Ramp	0.31	-		0.33		
3	Carson St	I-605 NS Direct On Ramp	Unsignalized On Ramp	0.55	_		0.49	-	
4	Carson St	Pioneer Blvd	Existing Traffic Signal	0.84	37.3	Đ	0.92	44.5	D
5	Spring St/Cerritos Ave	I-605 SB Off Ramp	Existing Traffic Signal	0.75	15.5	В	0.64	10.7	В
6	Spring St/Cerritos Ave	I-605 NB On Ramp	Existing Traffic Signal	0.80	7.1	. A	0.81	6.0	A
•	I-405 NB Direct Off Ramp	- Pous House	Unsignalized Off Ramp	0.47			0.46		
- 1	1-405 NB Direct On Ramp		Unsignalized On Ramp	0.41			0.25		_
	1-405 NB Loop Off Ramp		Unsignalized Off Ramp	0.30			0.28		
7	1-405 NB Loop On Ramp	Lakewood Blvd	Unsignalized On Ramp	0.57			0.45	_	
-	I-405 SB Loop On Ramp	DEAC WOOD SITE	Unsignalized On Ramp	0.25		**	0.29	-	- :
8	1-405 SB Direct Off Ramp	Łakewood Blvd	Unsignalized Off Ramp	0.48			0.50	_	
9	Willow St	Lakewood Blvd	Existing Traffic Signal	0.77	32.4	С	1.02	52.0	D
9	WillOW St	I-405 SB Loop Off Ramp	Unsignalized Off Ramp	0.38			0.49		
10	Willow St	I-405 SB Direct On Ramp	Unsignalized On Ramp	0.33	~		0.46		-
10	1-405 NB Off Ramp	P403 30 Direct Off Namp	Existing Traffic Signal	0.45	9.7	A	0.58	11.7	_ B
-	1-405 NB Loop On Ramp		Unsignalized On Ramp	0.59	-		0.39	-	
	I-405 NB Direct On Ramp	Bellflower Blvd	Unsignafized On Ramp	0.34		_	0.19		_
11		Beliflower Blvd	Existing Traffic Signal	0.93	37.7	D	1,25	105.9	F
12	Willow St	Beliflower Blvd	Existing Traffic Signal	0.69	26.0	C	1.22	65.5	E
13	Los Covotes Diagonai	I-405 SB Direct On Ramp	Unsignalized On Ramp	0.09	_	-	0.13		-
	I-405 SB Loop Off Ramp	Bellflower Blvd	Unsignalized On Ramp	0.13			0.40		Γ-
14	1-405 SB LOOP OF Namp	1-405 SB Direct Off Ramp	Existing Traffic Signal	0.58	11.4	В	0.56	10.2	В
15	Los Coyotes Diagonal	I-405 SB Loop On Ramp	Unsignalized On Ramp	0.35			0.19		-
16	Willow St	Los Coyotes Diagonal	Existing Traffic Signal	0.86	42.0	D	1.41	92.7	F
17	Willow St.	Woodruff Ave	Existing Traffic Signal	1.40	166.5	F	0.88	42.2	
1/	(-405 NB Direct Off Ramp	WCOdt dil Ave	Unsignalized Off Ramp	0.43	-	-	0.24		-
18	I-405 NB Direct On Ramp	Woodruff Ave	Unsignalized On Ramp	0.34	-	-	0.23		
TO	1-405 SB Direct Off Ramp	17000	Unsignalized Off Ramp	0.56	T -		0.45	-	
19	1-405 SB Direct On Ramp	Woodruff Ave	Unsignalized On Ramp	0.46	-	-	0.26		-
17	I-405 NB Direct Off Ramp		Existing Traffic Signal	1.02	22.9	C	0.80	14.0	
20	1-405 NB Loop On Ramp	Palo Verde	Unsignalized On Ramp	0.15		_	0.23	T	
21	Woodruff Ave	Palo Verde	Existing Traffic Signal	0.92	16.9	В	0.75	10.3	
22	Stearns St	Palo Verde	Existing Traffic Signal	1.02	30.8	С	1.02	29.9	_
23	Steams St	I-405 SB Direct On Ramp	Unsignalized Intersection	0.38	**	-	0.50		Ŀ
24	I-405 NB Direct On Ramp	Studebaker Rd	Existing Traffic Signal	0.68	4.5	A	0.56	3.9	_
25	1-405 SB Direct Off Ramp	Studebaker Rd	Unsignalized Intersection	1.20	116.8	F	0.45	20.1	
26	Atherton St	Studebaker Rd	Existing Traffic Signal	0.52	9.7	Α	0.68	17.1	
27	SR-22 WB On/Off Ramp	Studebaker Rd	Existing Traffic Signal	0.55	13.2	В	0.94	35,2	
28	SR-22 EB On/Off Ramp	Studebaker Rd	Existing Traffic Signal	1.02	37.5	D	1.10	44.4	
29	SR-22 EB On/Off Ramp	College Park Dr	Unsignalized Intersection	0.15	22.8	C	0.45	158.2	
30	7th St	Pacific Coast Highway	Existing Traffic Signal	1.04	55.9	E	1.04	49.7	
31	7th St	Reliflower Blvd	Existing Traffic Signal	1.17	72.3	E	1.10	57.0	
32	Pacific Coast Highway	Bellflower Blvd	Existing Traffic Signal	0.58	26.9	C	0.88	26.8	
33	7th St	Channel Dr	Existing Traffic Signal	0.77	10.2	В	1.04	39.1	
34	7th St	W, Campus Dr	Existing Traffic Signal	0.87	60.0	E	0.93	71.3	
35	7th St	E. Campus Dr	Existing Traffic Signal	1.14	59.3	E	0.99	18.9	

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1-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

	I tan	ation			T	2040 Albernati	ue 3 Condition	16
	600	stion				ak Hour		ak Hour
No.	East/West Street	North/South Street	Movement	Available Storage (ft)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No)	95th Percentile Queue (ft)	Adequat Storage (Yes or N
_			SBL	300	150	Yes	215	Yes
1	Carson St	1-605 SB Off Ramp	SBT	1,130	85	Yes	104	Yes
-			SBR	300	212	Yes	119	Yes
			NBL.	300 (650)	246	Yes	307	Yes
3	Carson St	1-605 NB Off Ramp	NBR	300(1175)	255	Yes	153	Yes
_			NBL.	120	277	· No	302	No
			SBL	140	82	Yes	84	Yes
4	Carson St	Ploneer Blvd	SBR	140	77	Yes	86	Yes
•		1 4 104 5 5 5	£BL	250	309	No	453	No
		!	WBL .	80	17	Yes	18	Yes
			SBL	220 (1240)	310	Yes	174	Yes
5	Spring St/Cerritos Ave	I-60S SB Off Ramp	SBR	900	0	Yes	0	Yes
6	Spring St/Cerritàs Ave	I-605 NB On Ramp	WBL	260	234	Yes	138	Yes
-	aparing any derinted york	T GOS THE CITTLE IN	NBL	180	141	Yes	160	Yes
			SBL	150	51	Yes	132	Yes
9	Willow St	Lakewood Blvd	EBL	175	90	Yes	85	Yes
			WBL.	150	36	Ves	167	No
_			WBL	1.870	72	Yes	194	Yes
11	I-405 NB Off Ramp	Bellflower Blvd	WBL/T/R	1,130	60	Yes	209	Yes
	7 -103 ND OII Hallip	Demondration and	WBR	410	54	Yes	189	Yes
-			NBL.	150	416	No :	81	Yes
		1	SBL	120	109	Yes	262	No
12	Willow St	Bellflower Blvd	EBL	140	123	Yes	144	No
		1	WBL	110	265	No	356	No
_			NBL.	160	28	Yes	41	Yes
		1	NBR	230	51	Yes	194	Yes
13	Los Cayotes Diagonal	Bellflower Blvd	EBL	190	260	No	701	No
			WBL	150	175	No	158	No
15	Los Coyotes Diagonal	1-405 SB Direct Off Ramp	SBI.	1525 (500)	150	Yes	128	Yes
20	cos coyotas Diegoriei	1-403 30 billect on reality	SBL	120	197	No	405	No
16	Willow St	Los Coyotes Diagonal	EBL	140	116	Yes	94	Yes
20	***************************************	cos coyotes biagonai	WBL	160	368	No	752	No
_			NBL	140	710	No	240	No
			Nas	60	39	Yes	29	Yes
			SBL	120	157	No	116	Yes
17	Willow St	Woodruff Ave	SBR	120	161	No	76	Yes
			EBL.	200	328	No	165	Yes
			WBL	180	265	No :	199	No
_			W3L	550	430	Yes	329	Yes
20	I-405 NB Direct Off Ramp	Palo Verde	W8T/R	1,155	78	Yes	179	Yes
			EBL	335	334	Yes	241	Yes
21	Woodruff Ave	Palo Verde	EBR	335	333	Yes	194	Yes
			NBL	130	202	No	197	No.
		}	SBL	120	84	Yes	113	Yes
22	Steams St	Palo Verde	EBL	90	250	No	239	No.
		ŀ	WBL	80	42	Yes	132	No
			NBL	100	83	Yes	66	Yes
24	I-405 NB Direct On Ramp	Studebaker Rd	SBR	70	19	Yes	22	Yes

# **GL-9 (Continued)**

I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

	Loca	tion				2040 Alternativ	ve 3 Condition	s
			1		AM Pe	ak Hour	PM Pe	ak Hour
No.	East/West Street	North/South Street	Movement	Available Storage (ft)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No)	95th Percentile Queue (ft)	Adequate Storage? (Yes or No.
			NBL	200	100	Yes	66	Yes
			SBL	260	1	Yes	2	Yes
26	Atherton St	Studebaker Rd	SBR	70	11	Yes	21	Yes
			EBL	120	86	Yes	249	No
			WBL	220	31	Yes	27	Yes
27	SR-22 WB On/Off Ramp	Studebaker Rd	NBR	150	14	Yes	32	Yes
41	3x-22 we on/on xamp	Scotteoaker Kd	SBL	200	71.	Yes	169	Yes
			NBR	300	1288	No	1154	No
28	SR-22 EB On/Off-Ramp	Studebaker Rd	SBL	. 150	418	No	302	No
			WBR	60	55	Yes	316	No
30	7th St	Pacific Coast Highway	NBL	330	200	Yes	302	Yes
30	70150	Pacific Coast Highway	SBL	290	369	No	40G	No
			NBR	130	63	Yes	35	Yes
			SBL	160	220	No	306	No
31	7th St	Bellflower Blvd	SBR	160	126	Yes	502	No
			E81.	200	495	No	421	No
			WBL	200	44	Yes	64	Yes
			NBL	280	107	Yes	84	Yes
			SBL	240	263	No	81	Yes
32	Pacific Coast Highway	Bellflower Blvd	SBR	60	7	Yes	2	Yes
32	Pacific Coast Highway	pelmower blvd	EBL	110	54	Yes	253	No
			WBL	120	54	Yes	67	Yes
			WBR	200	61	Yes	42	Yes
			EBI.	270	116	Yes	28	Yes
33	7th St	Channel Dr	EBR	180	1	Yes	7	Yes
			WBL	280	107	Yes	213	Yes
34	7th St	W. Campus Dr	SBL/R	150	73	Yes	276	No
54	/tn 5t	vv. campus or	EBL	400	90	Yes	5	Yes
			SBL	150	82	Yes	213	No
35	7th St	E. Control Dr.	SBT/R	150	71	Yes	128	Yes
22	/tn ac	E. Campus Dr	EBL	150	224	No	99	Yes
			WRI.	300	80	Yes	147	Yes

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I-405 Improvement Project Supplemental Traffic Study

# **GL-9 (Continued)**

Long Beach Area Truffic Study

and the second	1			-		-						
	1		N	tainline			Afternati	we 3 (Ye	ar 2020) Co	nditions		
l Landau	Lane					AM P	eak Hour			PMP	ak Hour	
Location	Туре	Birection	Lenes	Capacity <sup>1,4</sup>	Traffic Demand Volume <sup>1</sup>	n/c	Bansity <sup>2</sup>	LOS	Traffic Demand Volume <sup>1</sup>	D/C	Density	LOS
				1-405 No	ac-lime					Sinasia	0	
	GP	NB .	5	9,250	9,920	1.07	-	F	10,550	114		r
Temple Avenue to		.58	. 5	9,250	9,910	107	379	€	10,190	111		F
Lakewood Boulevard/Willow Street	HOV	NB	1	1,850	1,850	1.00	-	**	3,010	1.20	-	-
	1101	58	1	1,850	1,660	0.90		-	1,960	1.06	-	-
	GP	NB	5	9,250			Weaving 9	egment-	Refer to Wes	we Table		
Lakewood Boulevard/Willow Street to		SB	5	9,250	1		Weaving 5	egment -	Hefer to Wee	wa Table		
Bellflower Boulevard	HOV	NB	1	1,850	1,820	0.98	-	(-	2,060	1.11	-	17
		58	1	1,650	1,650	0.90	-	(44)	2,180	1.15	-	-
	GP	NR	.5	5,250			Working S	egment -	Refer to Wes	rve Table		
Belfflower Boulevard to	-	58	5	9,250			Weaving S	egmant -	Refer to Wes			
Woodruff Avenue	HOV	NB	1	1,850	1,870	1.01	-	**	3,870	1.01	-	-
		59	2	1,850	1,680	0.91	-	-	2,130	1.15	-	-
	GP	NB	5	9,250				epnent -	Refer to Wee	ve Table		
Woodruff Avenue to	-	90	4	7,402	8,890	120	*	P	9 110	1.23		F
Palo Verde Avenue/Stearns Street	HOV	NB	1	1,850	1,820	0.98	-	-	1,850	1.00	-	
	1100	58	1	1,850	1,740	0.94	-	-	2,130	1.15		-
	GP.	NB	5 ,	9,250			Wreeving Si	egment -	Refer to Wea	elcaT avi		
Palo Verde Avenue/Stearns Street to	0	SB	5	9,250		S-1/1/10	Wewveng Se	egment -	Refer to Was	we Table		-
Studebaker Road	HOV	NB	1	1,850	1,660	0.50	-	C+0.	1,850	1.00	-: 1	-
	HOV	SB	1	1,850	1,740	0.94	-	-	1,970	1.09	-	
	GP .	NB	4	7,400	9.090	1.23		F	10,480	1.42	+	F
Studebaker Road to	Or .	58	5	9,250	9,000	0.97	92.2	0	9,470	1.02	42.3	
I-605 NB Off Ramp	HOV	ME	1	1.850	2,070	1.12	- 1		2,290	1.24	- 1	-
	nov	\$8	1	1,850	1,770	0.96	2	-	1,970	1.06	-	-
	GP.	NB	1	7,400	9.090	1.28	-	F	10,480	1.42	-	· F
606 PR CH 2000 Lo 74 PL CH 2000	GP	58	4	7,400	7,590	1.04	363	2	8,350	1.18		F
1-605 NB Off Ramp to 7th St Off Ramp		NB	1	1,850	2,070	1.12	-	-	2,290	1.24	-	-
	HOV	ŚB	1	1,850	1,770	0.96	-	**	1,970	1.06	- 1	-
		NH.	4	7,400	7,640	1.03	427	E	9,040	1.22	_0	F
	GP	58	4	7,400	7,600	105	35.5	-	8 190	111	-	F
7th St Off Romp to I-605 \$8 On Ramp	1	NB	1	1,850	2.070	1.12	-	-	2,290	1.24	-	-
	HOV	SB	1	1.850	1,770	0.96			1.970	1.06		_
			Name of Street	1-605 Ma		2.30			1,570	1.00		_
	1000	NB	4 1	7.400	5,740	0.78	25.0	c	6.530	0.88	31.5	D
Carson Steet to	GP :	58	4	7,400	7,730	2.04	37.4	E	7,600	1.03	37.8	E
Spring Street	HOV	NB	1	1,850	1,490	0.81	-	-	1,750	0.95	-	-
WILLIAM COLD IN	MOV	SB	1 :	1,850	1,490	0.81	-	-	1,400	0.75	-	-
2.77.2000 (MC.77.07) (C.07.07)	GP	NB	4 1	7,406	4,986	0.67	203	C	5,500	0.74	22.5	C
	Ur	58	4	7,400	6,670	0.90	28.5	D	6,190	0.84	72.8	C
Millow Street/Katella Ave	HOV	MB	1	1,850	J,840	0.99		-	1,870	1.01	-	-
		SB SB	1	1,850	1,490	0.81	-	-	1,400	0.76	-	-
War from Novella to a fin hand on	GP	NB	8	9,250	5,010	0.54	166	8	5,750	0.62	20:9	C
	-	58	4	7,400	5,660	0.76	24.3	(	5,500	0.74	26.2	ō
samp to I-eus	HOV	MB	1	1,850	1,370	0.74	-	-	1,800	0.97	-	-
		58	1	1,850	1,350	0.74	-	-	1,400	0.76	- 1	-
pring Street pring Street to Willow Street/Natella Ave Willow Street/Natella Ave CD Road On Amp to 1-465		ro T	2 1	7th Street I	davides	0.00	40.0	-	-	0.21	111	_
epper Tree Lane to Studebaker Road	GP	E8	3	3,700 5,550	2,950 3,860	0.80	207	8	2.730	0.74	146	В
		EB	2	3,700	4,140	112	413	C	3,830	0.69	20.5	C
itudebaker Road to I-505	GP	EB	A 1	3,700	7,240	4.16	41.3		3,360	0.90	30 6	9

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- Treat hour capacity and traffic volumes are abown in webdies per hour (syst).

  2. Demoit y advois its nessenger cray/miss/sets (polysis/s).

  3. Demoit y advois its nessenger cray/miss/sets (polysis/s).

  5. Used of Service (USO): General investe (GO) and about on density except when derraind-do-sauseity (D/C) raided greater than or equal to 1.0, which is LOS F.

  4. Poss/hour capacities for foreway in mis include: 1,850 rays for each OF lane and a single high Occupancy Vehicle (HOV) lane.

  5. \*\*Descript in a cross of dep Cynforth, but relates (DO) and

Orange County Transportation Authority

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	Table 4.6-6: Alternative 3 (Year 2020) Ramp Junction Peak Hour Level of Service	3 (Year 2	.020) Ran	np Junct	ion Pe	ak Hour	Level	of Servic	اه		
						Alternat	ive 3 (Yea	Alternative 3 (Year 2020) Conditions	ditions		
					AM	AM Peak			M	PM Peak	
Interchande	Samo Tvoe	Ramp	Ramp <sup>2,4</sup>	Ramp	a	Ramp Junction	nction	Ramp		Ramp Junction	oction
		Panes	Capacity	Traffic Volume <sup>1</sup>	2/4	Density <sup>2</sup>	<sub>51</sub> 801	Traffic Volume <sup>1</sup>	D/C	Density?	ros <sub>378</sub>
			-405 Ramp Junctions	unctions							
	NB Off Direct	7	3,000	1,000	0.33	14.7	m	980	0.33	16.7	u.
	NB On Loop	1	1,500	790	0.53	46.9	ш	620	0.41	52.8	4
Lakewood Blvd	NB On Direct		1,500	999	0.37	25.9	U	340	0.23	28.4	ш.
& Willow St	SB Off (Direct + Loop)	2	3,000	1,190	0.40	18.5	60	1,370	0.46	20.6	ш.
	SB On Loop	-	1,500	320	0.21	43.4	u	410	0.27	44.1	L.
	SB On Direct (from Willow St)	-	1,500	450	0.30	22.4	u	620	0.41	23.0	U
	NB Off Direct	-1	1,500	520	0.35	28.1	۵	570	0.38	33.4	u.
Beliflower Blvd &	NB On (Direct + Loop)	2	3,000	1,290	0.43	15.2		980	0.29	14.3	-
Los Coyotes Diagonal	SB Off (Direct + Loop)	2	3,000	1,450	0.48	17.7	20	1,990	0.66	22.6	-
	SB On (Direct + Loop)	,	1,500	980	0.65	35.6	-	1,410	0.94	34.6	ıL
	NB Off Direct	1	1,500	009	0.40	24.5	U	330	0.22	27.6	O.
	NB On Direct	-	1,500	470	0.31	36.0		320	0.21	43.0	<u>-</u>
Woodruff Ave	SB Off Direct	1	1,500	780	0.52	35.6	В	570	0.38	38.8	4
	SB On Direct	1	1,500	640	0.43	23.5	u.	300	0.20	25.3	ш.
	NB Off Direct	1	1,500	3	0.44	25.4	0	800	0.53	30.9	ш
Palo Verde Ave	NB On Loop	1	1,500	210	0.14	54.8	4	320	0.21	62.7	ш.
& Steam St	SB On Direct (from Steam St)	-	1,500	530	0.35	26.7	_	630	0.42	56.9	11_
	NB On Direct	1	1,500	310	0.21	56.8	F	310	0.21	0.99	u.
Studebaker Rd	SB Off Direct		1,500	410	0.27	36.2	ш	260	0.17	36.5	ш
	100000000000000000000000000000000000000		905	8	1	2 26		150	:	300	u

Long Beach Area Tr

Table 4.6-6: Alternative 3 (Year 2020) Ramp Junction Peak Hour Level of Service

**GL-9 (Continued)** 

# **GL-9 (Continued)**

		_				Alternat	ive 3 (Yea	Alternative 3 (Year 2020) Conditions	litions		
					AM	AM Peak			PM	PM Peak	
Interchange	Ramo Tone	Катр	Ramp <sup>3,4</sup>	Ramp		Ramp Junction	nction	Ramp		Ramp Junction	nction
		Lanes	Capadity	Traffic Volume <sup>2</sup>	)/d	Density <sup>1</sup>	s/e\$01	Traffic Volume <sup>1</sup>	D/C	Density <sup>2</sup>	10525
		-	1-605 Ramp Junctions	unctions							
	Na Off Direct	-1	1,500	1,020	0.68	31.7	۵	940	0.63	346	۵
	NB On Loop	1	1,500	430	0.29	19.7	æ	460	031	22.4	U
Sarana G	NB On Direct	1	1,500	770	0.51	20.2	U	069	0.46	22.0	u
2000	SB Off Direct	2	3,000	1,220	0.41	13.6	80	1,410	0.47	15.0	0
	S3 On Loop	-1	1,500	200	0.33	22.1	U	460	0.31	21.8	U
	SB On Direct		1,500	280	0.19	22.6	U	320	0.21	22.2	u
Continu Ct (Complete Aum	NB On Loop	1	1,500	260	0.51	18.3	8	1,030	0.69	19.4	9
Spilling Sty Certifics Ave	SB Off Direct	1	1,500	1,070	0.71	34.8	۵	1,410	0.94	36.2	w
	NB Off (Direct + Loop)	ed	1,500	1,070	0.71	0.4	A	1,660	1.11	5.5	∢
	NB On Direct	4-1	1,500	1,040	69'0	19.4	8	1,420	0.95	20.9	٥
Willow St/Katella Ave	SB Off Direct	ч	1,500	530	0.35	33.7	۵	200	0.33	31.5	۵
	SB Off Loop	ч	1,500	1,070	0.71	34.4	۵	1,010	0.67	32.1	٥
	SB On Direct (Direct + Loop)	14	1,500	280	0.39	23.7	U	810	0.54	22.8	U
		7th	7th Street Ramp Junctions	Junctions							
	EB Off Loop	1	1,500	130	60.0	32.0	۵	099	0.44	29.9	٥
Studenakar Bri	EB On Loop	7	1,500	1,230	0.82	37.7		1,420	96.0	323	۵
	WB Off Loop	ĭ	1,500	780	0.52	42.6	F	1,430	0.95	49.7	-
	WB On Loop	1	1,500	240	0.36	29.1	٥	490	0.33	3.0	⋖
									l		

Long Beach Area Traffic Study

Ramp   Traffic   D/C   Density   LOS 50 100 50 100 100 100 100 100 100 100 1						П		Ш				
Ramp   Inches   Inches   Ramp   Inches   Inch							Alternati	ve 3 (Year	r 2020) Cond	itions		
Ramp Type   Ramp Pamp <sup>1,4</sup>   Ramp Pamp Pamp <sup>1,4</sup>   Ramp Pamp Punction   Lanes Capadty   Traffic   Volume <sup>2</sup>   D/C   Density   LOS <sup>1</sup>   Traffic   LeGis SB 10 i-405 NB   2   3,500   1,310   0.44						AM	Peak			М	PM Peak	
Freeway - 10 - 1500   Traffic   Density   Los   Capacity   Traffic   Density   Los   Los   Capacity   Volume - 1   Volume - 2   Density   Los   Los   Capacity   Los   Capacity   Los   Capacity   Los   Capacity   Los   Capacity   Los   Capacity   Capac	Interchange	Power Town	Ramp	Ramp <sup>1,4</sup>	Ramp		Ramp Jur	ıctjou	Ramp		Ramp Junction	rction
HeGIS SB 10   HGIS NB   Treeway Branch Connectors   HeGIS SB 10   HGIS NB   To Freeway Branch Connectors   HGIS SB 710   ST 2   ST 20   ST		adi duna	Lanes	Capacity	Traffic Volume <sup>2</sup>	D/C	Density <sup>2</sup>	17507	Traffic Volume <sup>1</sup>	<b>D/C</b>	Density? LOS <sup>3,5</sup>	LOS <sup>3,5</sup>
Helio Sig to I Holio NB			reeway - to	· Freeway	Branch Con	nectors						
H-605 S8/7/th S1 to H-469 NB         2         3,600         1,460         0.41             H-405 S8 to H-607 NB         2         3,500         1,310         0.36             H-605 S8 to P6 VF VF VF         2         3,500         4,500         1,33             H-605 S8 JF ADS SB LP TR ST         1         1,800         2,220         1,32             Th St to H-605 NB/H-405 NB         2         3,600         1,340         0.37		I-605 SB to I-405 NB	1	1,800	790	0.44	-	-	1,000	0.56	:	:
1-405 SI to 1-605 NB		1-605 SB/7th St to 1-405 NB	2	3,600	1,460	0.41			1,430	0.40	:	:
1-605 SB to 7th 5t/1-405 SB		1-405 SB to 1-605 NB	2	3,500	1,310	0.36	:	-	1,130	0.31		:
1-605 S8/4 ads S8 to 7th St         1         1,800         2,020         1.12         -         -           7th St to 1-605 NB/405 NB         2         3,600         1,340         0.37         -         -	-405/ -505  -405/ -505	I-605 SB to 7th St/I-405 SB	2	3,600	4,850	1.35	:		4,500	1.25	:	:
1-405 NB 2 3,500 1,340 0.37	riecwoy interding ges	1-605 SB/1-405 SB to 7th St	1	1,800	2,020	1.12	:		1,930	1.07		1
		7th St to I-605 NB/I-405 NB	2	3,500	1,340	0.37	_	1	1,170	0.33		1
1 1,800 720 0.40		7th St to I-405 NB	1	1,800	720	0.40	:		430	0.24	***	:

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I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

Table 4.6-7: Alternative 3 (Year 2020) Weaving Level-of-Service Freeway and Collector-Distributor Roads

	AM Peal	k Hour	PM Peul	k Hour
Weaving Segment	Density	LOS <sup>2</sup>	Density <sup>2</sup>	LOS
Freeway Mainline		774	177	
I-405 Southbound -	45.4	F	73.4	F
Lakewood Boulevard/Willow Street to Bellflower Boulevard I-405 Northbound - Bellflower Boulevard to Lakewood Boulevard/Willow Street	50.2	F	43.5	F
I-405 Southbound - Bellflower Boulevard to Woodruff Avenue	42.8	E	68.6	F
I-405 Northbound - Woodruff Avenue to Beliflower Boulevard	55.0	F	50.3	F
I-405 Northbound - Palo Verde Avenue/Stearns Street to Woodruff Avenue	48.6	F	42.8	E
I-405 Southbound - Palo Verde Avenue/Steams Street to Studebaker Road	34.5	D	45.6	·F
I-405 Northbound - Studebaker Road to Paío Verde Avenue/Stearns Street	46.1	F	47.8	F
Collactor-Distributor (C-D) Roads				
Lakewood Boulveard/Willow Street Interchange at 1-405				
Southbound C-D Road	16.2	8	22.5	С
Bellflower Boulevard/Los Coyotes Diagonal Interchange at I-405	, , , ,			
Southbound C-D Road	5.0	A	3.8	А

- 1. Density is shown in passenger cars/mile/lane (pc/mi/ln).
- 2. Level of Service (LOS) is based on density (pc/ml/ln). The density LOS thresholds are different
- for the freeway mainline and collector-distributor roads.

# **GL-9 (Continued)**

1-405 Improvement Project Supplemental Traffic Study

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			t/	tainline			Alternati	ve 2 (Yes	or 2040] Con	ditions		
	Lane			· · · · ·		AM Po	eak Hour			PM Pe	ak Hour	
Location	Туре	Direction	Lanes	Capacity <sup>1 8</sup>	Truffic Demand Volume <sup>1</sup>	D/C	Density <sup>2</sup>	ros	Traffic Demand Volume <sup>1</sup>	D/C	Density'	LOS
				1-405 Ma	miline					_	_	7
	GP.	NB	5	9,250	10,730	1.16		F	11,410	1 28	- 1	F
Temple Avenue to	- 01	S8	5	9,250	10,710	1.16		F	11,130	1.20		F
Lakewood Boulevard/Willow Street	HOV	N6	1	1,850	2,000	1.08	- "	-	2,200	1.19	-	-
		SB	1	1,850	1,800	0.97		-	2,123	1.15	-	-
	GP	NB	5	9,250		was text 1	Weaving 5	egrownt -	Refer to Wea	ve Table		
Laktwood Bouleward/AVillow Street to		SB	5	9,250			Weaving S	eament-	Refer to Wear	ve Table		144000
Beliflower Boulevard	HQV	NB	1	1,850	1,970	1.06		**	2,220	1.20	- 1	-
	1.01	SB	1	1,850	1,600	0.97	-	-	2,360	1.24	- 1	-
	GP	M8	. 5	9,250			Weaving S	egment -	Befor to Wear	ve Trble		
Beliffower Boulevard to	u.	SB	- 5	9,250			Weaving S	rgment -	Refer to Wear	ve Table		
Woodruff Avenue	HOV	NB	1	1,850	2,020	1.09	-	~~	2,020	1.09	- 1	
	mov	SB	1	1,850	1,823	0.98	-		2,300	1.24	-	
	GP	NB	5	9,250			Wearing S	egment -	Refer to Wee	eldsTav		
Woodruff Avenue to	All	58	4	7,400	9,610	1.30	A	7	9.850	1.33	- ma	F
Palo Verde Avenue/Stearns Street	HOV	NB	1	1,850	1,970	1.06	-	***	2,000	1.08	- 1	
	HOV	SB	1	1,850	1,883	1.02	- 1	-	2,300	1.24	- 1	
	GP	MB	5	9,150			Weaving S	rgmant-	Refer to Wear	ve Table		
Palo Verde Avenue/Steams Street to	GP	58	5	9,250			Weaving Si	great-	Refer to Wear	ve fable		
Studepaker Road	HOV	NB	1	1,850	1,800	0.97		**	2,000	1.08		
	HOV.	SB	1	1,850	1,860	1.02	-		2,130	1.15	- 1	
	GP	NB 1	4	7,400	9,830	1.33		F	11.330	1.53		7
Studebaker Road to	GP	SB	5	9,250	9,730	1 05	37.2		10,240	111		F
I-605 NB Off Ramp	HOV	NB	1	1,850	2,240	1.21	- 1	-	2,480	1.34	- 1	
	HOV.	88	1	1,650	1.910	2.03	-	-	2,130	1.15	-	
,	GP	NB	1	7,400	9,830	1.33	-*	F	11,330	1.53	1,0	F
1-605 NB Off Ramp to 7th St Off Ramp	GP	SB -	4	7,400	8,320	1.12	43.4	E	9,080 3	1.22		F
Podd NB Off Ranch to 741 St Off Ramp		N8	1	1,850	2,240	2.21	-	-	2,480	1.34		
	HOV	SB	1	1,850	1,910	1.03		-	2,130	1.15	-	-
	GP	NB	4	7,400	8.260	1 12	*	F	9,780	132	-2	F
7th St Off Ramo to I-605 SB On Ramo	СМР	SB	4	7,400	8,220	1.11	42.1	E	B.850	1.20		F
711 St Off Ramp to I-503 SB On Ramp		NB	1	1.850	2,240	1.21	10	-	2,480	1.34		÷
	HOV	82	1	1.850	1.910	1,03	-		2,133	115	- 1	
				1-695 Mar	okoe			11.7				_
	GP	NB I	4	7,400	6,210 ;	0.84	27.4	D	7.060	0.95	35.0	D
Carson Steet to	- GP	58	4	7,400	8.360	1.13	-*	F	R.220	2.11		F
Spring Street	HOV	NB	1	1,350	1,620	0.88	-	-	1,900	1.03	- 1	-
		SB	1	1,850	1,620	0.88	-	-	1,520	0.82	-	-
Soring Street to	SP	NB	4	7,400	5,390	0.73	22.0	С	5,950	0.80	24.6	_ c
Spring Street to Willow Street/Katella Ave	_	58	4	7,400	7,210	0.97	32.2	D	5.650	0.90	28.7	Đ
ALLIAN SCIENTING VAC	HOV	NB SB	1 1	1,850	1,990	1.08		_	2,320	1.09	- 1	
		SB NB	5	9,250	5,420	0.88	18.9	8	5,210	0.67	72.5	С.
Willow Street/Katella Ave CD Road On	GP	58	4	7,400	6,120	0.39	26.5	D D	5,940	0.67	22.5	C
Ramp to I-405		NB B	1	1,850	1,499	0.81	20.0		1,950	1.05	70.3	- 0
	HOV	58	1	1,850	1,483	0.80	- 1		1.520	0.82	-	-
				7th Street M					2.00	3702		_
Pepper Tree Lanc to Studebaker Road	GP '	£B	2	3,700	2,550	C 80	15.8	8	2.730	0.74	14.6	9
report free tane to Studebaker Road	GP.	W3	3	5,553	3,860	C 70	20.7	C	3,830	0.59	205	- 6
Studepaker Road to I-605	GP.	EB	2 1	8,700	4,140	1.12	41.3	E	3.560	0.96	308	D
manus (manus (0.7°00))	31	WB	2 1	3,700	4,120	1.15	40.9	E	4.850	131	. 1	ē

a. rear more capacity and ormic vectories are a received per part (vph).

2. Density is short in pattainger carried/fates (pright ed.).

3. Level of Service (LOS): General X-ryosa (GP) invel.OS is based on dentity except when demand-to-tapacity (D/C) radio is greater than or equal to 1.0, which is LOS F.

4. Peek hoor capacities for freeway bans include 1,350 up for each GP are and a single right Occupancy Vehicle (HOV) face.

3.\*\* Density is in excess of 65 perior first therefore LOS (II).

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GL-9	(Continued)

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						Alternat	ive 3 (Year	Alternative 3 (Year 2040) Conditions	ltions		П
					AM	AM Peak			PM	PM Peak	
Interchange	Ramp Type	Ramp	Ramp <sup>2,4</sup>	Ramp		Ramp Junction	nction	Ramp		Ramp Junction	nction
		ranes	Capacity	Traffic Volume <sup>1</sup>	2/0	Density <sup>2</sup>	F(\$01	Traffic Volume <sup>1</sup>	D/C	Density <sup>2</sup>	SOT.
		7	1-405 Ramp Junctions	tions							
	NB Off Direct	2	3,000	1,080	0.36	168	-	1,070	36.0	10.0	1
	NB On Loop	1	1,500	850	0.57	503		670	0.45	5 22	
Lakewood Blvd	NB On Direct	-	1,500	610	0.41	27.8		360	0.24	808	
& Willow St	SB Off (Direct + Loop)	2	3,000	1,290	0.43	20.9	-	1,480	0.49	23.1	-
	SB On Loop	1	1,500	340	0.23	46.7	u	440	0.29	47.5	1
	SB On Direct (from Willow St)	1	1,500	490	0.33	24.0	Ç	680	0.45	24.6	-   4
	NB Off Direct	1	1,500	260	0.37	30.7	a	000	0.41	36.5	
Beliflower Blvd &	NB On (Direct + Loop)	2	3,000	1,390	0.45	173	u.	930	0.31	163	-
cos coyotes Diagonal	SB Off (Direct + Loop)	2	3,000	1,560	0.52	37.7	_	2,160	0.72	25.5	-
	Se On (Direct + Loop)	-	1,500	1,060	0.71	37.7	u.	1,530	1.02	36.3	u
	NB Off Direct	1	1,500	650	0.43	27.2	u	360	0.24	30.6	u.
Woodruff Ave	Ne On Direct	**	1,500	510	0.34	38.5		350	0.23	46.1	1
	SB Off Direct	-1	1,500	840	0.56	33.0	٥	620	0.41	33.1	u
	SB On Direct	11	1,500	069	0.46	24.5	u	330	0.22	26.7	4
Palo Verde Ave	NB Off Direct	7	1,500	710	0.47	28.3	ш,	860	0.57	34.2	
& Stearn St	N8 On Loop	1	1,500	220	0.15	58.5	14.	350	0.22	67.0	.   .
	SB On Direct (from Steam St)	1	1,500	570	0.38	28.1	u	089	0.45	28.1	
Studebaker Rd	NB On Direct	1	1,500	330	0.22	61.6	u	340	2 2 2	717	.  -
	SB Off Direct	-	1,500	440	0.29	39.0	ш	T	910	30.3	u

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						Alternat	ive 3 (Yea	Alternative 3 (Year 2040) Conditions	ditions		
					AM	AM Peak			PM	PM Peak	
		Ramp	Ramp <sup>1,4</sup>	Ramp		Ramp Junction	Inction	Явшр		Ramp Junction	nction
Interchange	Камр Гуре	Lanes	Capadiy	Traffic Valume <sup>1</sup>	<b>3/</b> 0	Density	57ESO7	Traffic Volume <sup>1</sup>	D/C	Density <sup>2</sup>	105,13
		3	-605 Ramp Junctions	ctions							
	NB Off Direct	1	1,500	1,100	0.73	34.2	0	1,020	0.68	37.3	u.
	NB On Lond	1	1,500	460	0.31	20.9	0	490	0.33	73.7	O
	NB On Direct	1	1,500		0.55	21.1	v	740	0.49	23.1	٥
Carson St	S8 Off Direct	2	3,000	1,320	0.44	15.6	8	1,530	0.51	17.3	20
	SB On Loop	1	1,500	540	0.35	23.2	U	200	0.33	22.9	S
	SB On Direct	4	1,500	300	0.20	23.8	u.	350	0.23	23.3	ш.
	NB On Loop	-	1,500		0.55	19.0	8	1,110	0.74	20.0	٥
Spring St/Cerritos Ave	SB Off Direct	1	1,500	1,150	0.77	37.4		1,520	1.01	38.9	w
	NB Off (Direct + Loop)	-	1,500	1,160	0.77	1.5	4	1,800	1.20	99	4
	NB On Direct	-	1,500	1,130	0.73	20.2	U	1,530	1.02	21.9	U
Willow St/Katella Ave	SB Off Direct	-	1,500	570	0.38	36.2	ш	240	0.36	33.8	٥
	SBOff Loop	1	1,500	1,150	0.77	36.9	w	1,090	0.73	34.6	٥
	SB On Direct (Direct + Loop)	-1	1,500	630	0.42	25.3	U	880	0.59	24.3	_
		#	7th Street Ramp Junctions	Junctions							
	EB Off Loop	-	1,500	140	0.09	32.0	٥	720	0.48		0
	EB On Loop	-	1,500	1,330	0.89	38.5	u.	1,540	1.03	333	
Studebaker Rd	WB Off topp	-	1,500	840	0.56	45.6	ш	1,550	1.03	49.7	-
			VO3 .	002	01.0	20.5	c	240	0.36	29.4	٥

NOSI

	lable 4.5-5: Alternative 3 (Year 2040) Ramp Junction Peak Hour Level of Service		Day Nami	Junctio	rea	T HOUL	evel of	Service	ı		
						Altema	ilve 3 (Yea	Alternative 3 (Year 2040) Conditions	ditions		
					AM	AM Peak			PM	PM Peak	
Interchange	Ramp Type	Ramp	Ramp <sup>1,4</sup>	Ramp	7	Ramp Junction	inction	Ramp		Ramp Junction	nction
		Lanes	Capacity	Traffic Volume <sup>a</sup>	D/C	Density <sup>2</sup> LOS <sup>3,3</sup>	10833	Traffic Voluma <sup>2</sup>	D/C	Density <sup>2</sup>	LOS <sup>15</sup>
		Freeway - to	Freeway - to - Freeway Branch Connectors	anch Conne	, right						
	1-605 SB to 1-405 NB	1	1,800	860	0.48	,	Ŀ	1,080	09.0	-	Ŀ
	1-605 SB/7th St to 1-405 NB	2	3,600	1,570 0.44	0.44		;	1,550	0.43	ļ,	ŀ
3.405/1.605	1-405 SB to 1-605 NB	2	3,600	1,410 0.39	0.39			1,220	0.34	1	
Freeway Interchanges	1-605 SB to 7th St/1-405 SB	2	3,600	5,260	1.46	:	1	4,870	1.35		ŀ
	1-605 SB/1-405 SB to 7th St	1	1,800	2,020	1.12			1,930	1.07	,	ŀ
	7th St to 1-605 NB/1-405 NB	2	3,600	1,450	0.40	,	1	1,260	0.35	,	1
	7th St to I-405 NB	**	1,800	077	0.43	1	,	460	0.26		

DRAFT

# **GL-9 (Continued)**

I-405 Improvement Project Supplemental Traffic Study

Long Beach Area Traffic Study

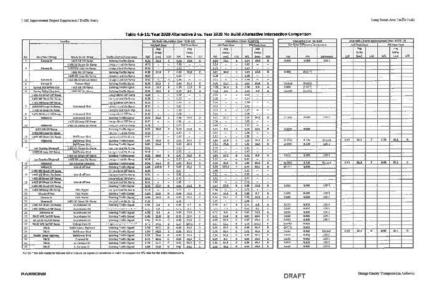
Table 4.6-10: Alternative 3 (Year 2040) Weaving Level-of-Service Freeway and Collector-Distributor Roads

	AM Peak	Hour	PM Peal	Hour
Weaving Segment	Density <sup>1</sup>	LOS²	Density <sup>L</sup>	LOS
Freeway Mainline			4 144	11
I-405 Southbound - Lakewood Boulevard/Willow Street to Bellflower Boulevard	51.3	F	81.2	F
I-405 Northbound -  Bellflower Boylevard to Lakewood Boulevard/Willow Street	55.1	F .	47.7	F
I-405 Southbound - Bellflower Boulevard to Woodruff Avenue	47.3	F	75.7	F
I-405 Northbound - Woodruff Avenue to Belifiower Boulevard	60.9	F	56.1	F
I-405 Northbound - Palo Verde Avenue/Stearns Street to Woodruff Avenue	53.4	F	47.3	F
I-405 Southbound - Palo Verde Avenue/Stearns Street to Studebaker Road	37.7	É	49.8	F
I-405 Northbound - Studebaker Road to Palo Verde Avenue/Stearns Street	50.8	F	53.0	F
Collector-Distributor (C-D) Roads				
Lakewood Boulveard/Willow Street Interchange at 1-405				
Southbound C-D Road	16.2	В	22.5	С
Beliflower Boulevard/Los Coyotes Diagonal Interchange at 1-40	5			
Southbound C-D Road	5.0	А	3.8	Α

- 1. Density is shown in passenger cars/mile/lane (pc/mi/ln).
- 2. Level of Service (LOS) is based on density (pc/mi/ln). The density LOS thresholds are different for the freeway mainline and collector-distributor roads.

**PARSONS** 

Orange County Transportation Authority DRAFT



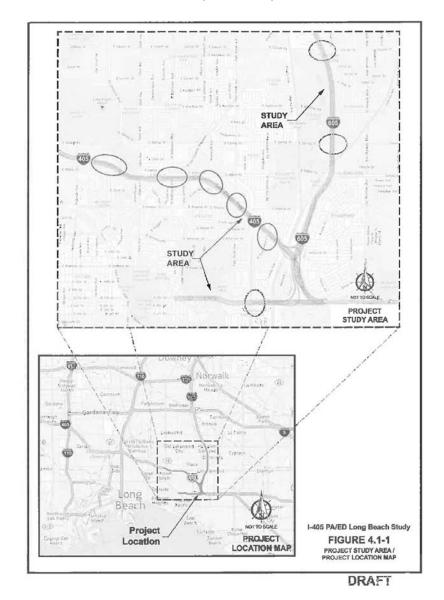
# **GL-9 (Continued)**

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۵.	**************************************	perhiture unan	2000 cartrol Greene Inc.	100	56,	-	100	140		11.		da.	as l		Dety Dety	1		w	Catalities	1 44	364	100	30	Date:	
7	Caronia	162/18 (00 BA1)	Priving Yorlfor Signal	140		E.	479	195		1 1 1		A3	b	5.82	14.6	100	84X	1877	LAMPET .	1-00	-00-	de	300		
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12.	West	Bd Flore Sad	Ecolog Tolk Clignet	1.65	(5.5.)	-	1.61		1.0	All				234		2.3	O.Pres	0.1 No.	Error		46.7	- 9-	8.62	90.5	
И		ad Court Mid	Exceed passes Plates	253	150	5	3.35	1.99.0	1	6.51		2.2		227.3	10-2	-6.5	-3un	1.6%	Erunné	1.34	22.6		3.48	59.4	
LE .	Log Dayword Dispayant	1465 Still Street Stylenge	strigge and School	647		+	9.15			1.30		-	-	.615	- 0	2.									_
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8	MINERAL CO.	URS FALSE	BROTTLE Traffic Separat	5.04	75.P	-	9.52	25.0	1-2-	셨	54-6	ä	84	101	10.5	-3-1	0,040	9.560	120	1	_			_	-
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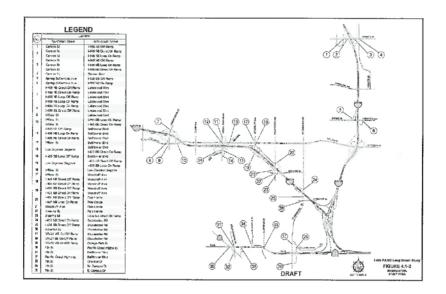
# **GL-9 (Continued)**

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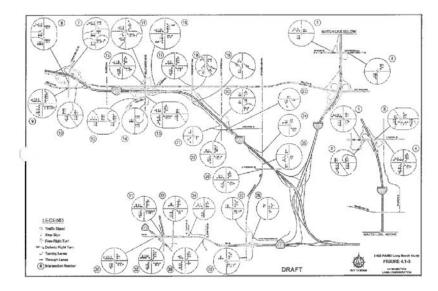
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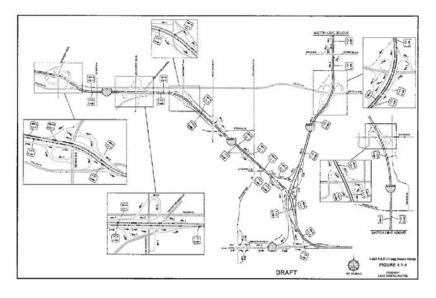
**GL-9 (Continued)** 

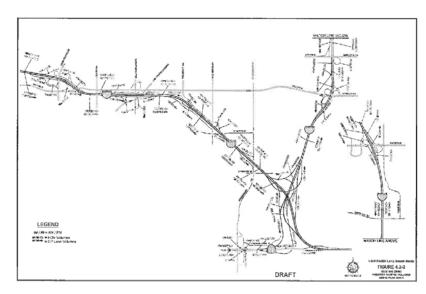


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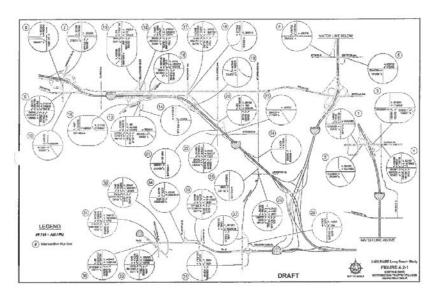


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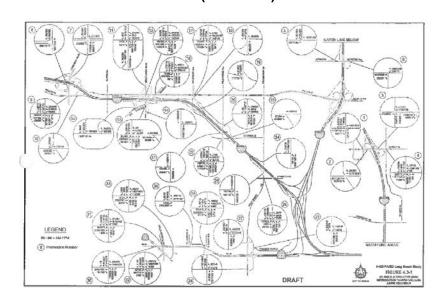




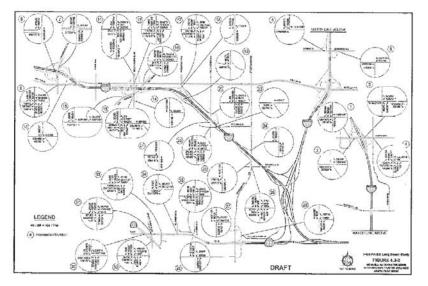
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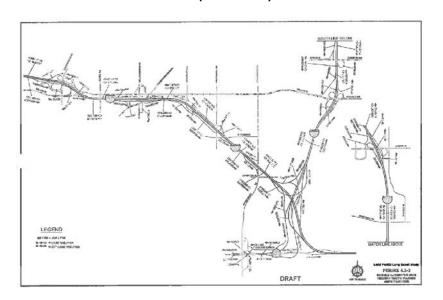
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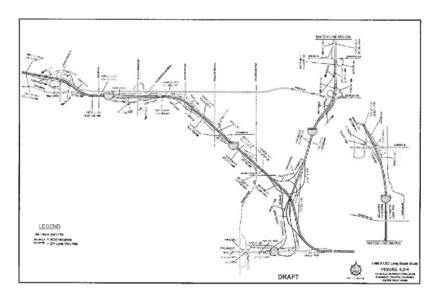
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**GL-9 (Continued)** 



**GL-9 (Continued)** 



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